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ABSTRACT

This document introduces the Edible Schoolyard Project (ESP) in which students create a garden, watch it grow, and develop a bond with nature. Chapters include: (1) "Implications of the Edible Schoolyard Project" (Wes Jackson); (2) "A World of Possibilities" (Alice Waters); (3) "The Garden Experience" (David Hawkins); (4) "From the Kitchen and the Table" (Esther Cook); (5) "An Edible Schoolyard Recipe: Red Chard Wraps"; (6) "Nurturing a Climate for School Change"; (7) "A Conversation with Educators"; (8) "Developing Ecoliteracy" (Yvette McCullough); (9) "The Principles of Ecology"; (10) "Creativity and Leadership in Learning Communities" (Fritjof Capra); (11) "A Time-Tested Recipe" (Zenobia Barlow); (12) "About the Center for Ecoliteracy"; and (13) "About the Edible Schoolyard." (YDS)

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The Edible Schoolyard

From the garden, and the kitchen, and the table, you learn empathy—for each other and for all of creation; you learn compassion; and you learn patience and self-discipline. A curriculum that teaches these lessons gives children an orientation to the future—it can give them hope.

ALICE WATERS

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The Edible Schoolyard

Learning in the Real World.
A PUBLICATION OF THE CENTER FOR ECOLITERACY

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WES JACKSON

Implications of the Edible Schoolyard Project

Wes Jackson

Wendell Berry's book, *The Unsettling of America*, from a score of years ago may be the most prophetic document in that era, the dual meaning in the title has not been fulfilled. As we unsettled the countryside, the young moved into cities, along with their moms and dads, creating an information implosion of sorts. As a result, the cultural language of agrarianism for moving stored sunlight in the form of food and fiber from ground to mouth is in decline. As we filled the likes of Silicon Valley with homes and electronic information enterprises, we now suffer from the spiritual dangers Aldo Leopold warned us about more than a half century ago: the belief that food comes from a grocery store and that heat comes from a stove. Leopold was talking about source.

It is safe to say that never in the history of *Homo sapiens* has there been a culture more ignorant of its source than that of the current population of the United States. Cheap oil, an irrational settlement pattern, and upward mobility have emerged along with the idea among many of us that we are too good to grow food.

Some personal history—I was raised on a Kansas farm by a Kansas family stretching back to 1854, the time Kansas was a territory. As a boy, I was educated in the agrarian life much like all of my Kansas ancestors before me. On that farm I was often told to go catch a chicken to be fried for the noon meal, to dig potatoes to be mashed, and to pick the tomatoes and onions. The quart of milk with the cream in the neck placed at everyone's plate came from our own cows from the previous night's milking. The sweet corn was pulled that morning before seven o'clock when it was cool, before the sugar turned to starch. Maybe we had been baling alfalfa hay that morning, captured sunlight to be stored in the barn that afternoon in preparation for a winter feeding six months away.

One of the most exciting things about the garden is that we are creating a magical childhood place for children who would not have such a place otherwise, who would not be in touch with the earth and the things that grow.

PHOEBE TANNER

I didn't know about photosynthesis then. I did not know about genetics of plant breeding or that someday I would study for a master's degree in botany and a Ph.D. in genetics, but I have to say that I learned more in those first 18 years on the farm and in the kitchen than I learned in all of my college and graduate courses. My teachers on the one hand were my family and my community and on the other hand they were the crops and livestock, soil, and seasons. My grandchildren do not have this advantage and I grieve that that is so. This is a dangerous situation we now have in this country.

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If we don't get sustainability in agriculture first, it is not going to happen. Agriculture ultimately has the science of ecology standing behind it. The industrial sector or the materials sector does not. The model garden at Martin Luther King, Jr. Middle School is the best shot we have at correcting this cultural failure.

Wes Jackson is the founder and director of The Land Institute in Salina, Kansas and author of *Becoming Native to This Place*, *Altars of Unhewn Stone*, *New Roots for Agriculture*, and other publications.

One of our major tasks as educators is to expand the imagination about our possibilities.

WES JACKSON,
Becoming Native to This Place

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A World of Possibilities

About 14 years ago I moved to the house where I live now, and started driving past King School on my way home from work at Chez Panisse—usually late at night, or early in the morning. Of course, at those hours there were never any kids around, and I was troubled by what I could see from the street. The school didn't look so good. In fact, it almost looked abandoned. I would see the graffiti on the windows and the burnt-out grass, and I would wonder what had happened. Who was using this school? Who was taking care of it?

Alice Waters and an enthusiastic MLK student proudly display a healthy crop of broccoli

These thoughts were in the back of my mind, when one day, in an interview, I was asked about education (I was a teacher once, in a Montessori school), and I remarked on how neglected King School looked. How can this be, I asked, in an enlightened community such as Berkeley, that the public schools are allowed to deteriorate like this? No wonder, in a way, that so many parents who can afford it send their kids to private schools.

Not long after this interview appeared, Neil Smith, the principal of King School, called me up. He wanted to talk about what I'd said, so I invited him to lunch. It turned out we were on the same wavelength. Although we were both worried about the next generation and felt the same urgency about what was going on out there in the world, we were both optimistic about how the schools could help. And before I knew it, we were on the way to launching the Edible Schoolyard project.

I learned that Neil and the administration, and the teachers, and the school district were all full of good will, willing to listen, and willing to experiment with new ideas. I also learned that on the inside there were people who cared about the school—here is a beautiful courtyard garden, and a grass baseball field and a renovated auditorium where until recently the seats were held together with duct tape.

The responsibility for the physical deterioration of this school, and so many like it, lies not with the brave and underpaid teachers and administrators. Not at all. I learned that it was my responsibility, as part of a larger society which pays lip service to education, but has not been willing to make it a national priority that every child is taught as well as every other child. If we were only willing to do this—if we were all willing to take responsibility for what Jonathan Kozol has called the "savage inequalities" of American education—then we could not only turn the situation at King School around—we could renovate schools everywhere, so that the kids will know that we really care about them.

Most education—all education—is primarily by example. How can we expect kids to respect themselves, or each other, or the community at large, when they are schooled in increasingly derelict places, many of which are much, much worse than King? Such schools reflect all too well the state of our society, where the gap between rich and poor just gets wider and wider, and where all too many kids—both rich and poor—are disconnected from civilized and humane ways of living their lives.

THE RITUAL OF NUTRITION

For a couple years now, I've been quoting Francine du Plessix Grey, who wrote a little essay in *The New Yorker* after she saw the movie *Kids*. *Kids*, you may remember, is a movie about a bunch of frighteningly amoral teenagers who are cruel, callous, and almost subhuman. Du Plessix Grey was haunted by the image of their fast food diet, which she described as "feral" and "boorishly gulped." And she went on to remark that the kids in this movie, like millions of others, "never seem to sit down to a proper meal at home." As she wrote: "We may be witnessing the first generation in history that has not been required to participate in that primal rite of socialization, the family meal."

This is a deeply shocking thought to me. Like du Plessix Grey, I believe that

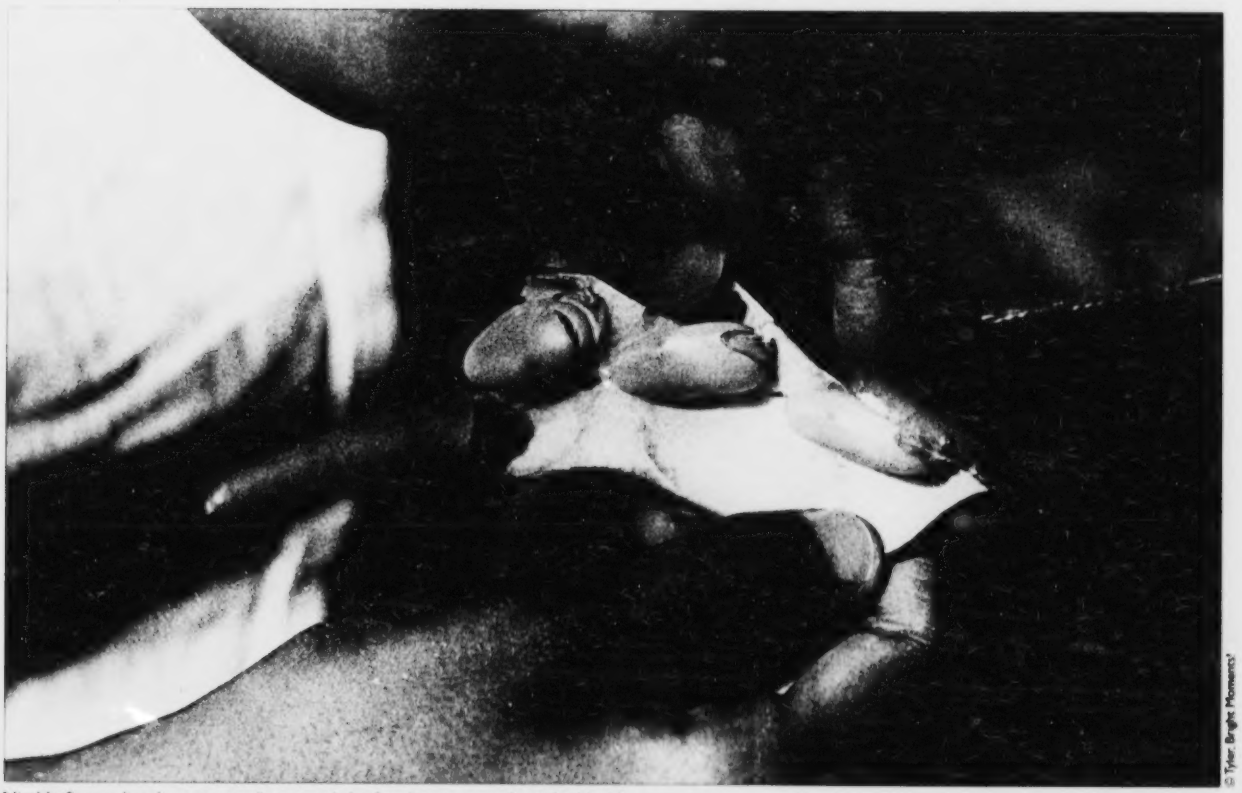
> "the family meal is not only the core curriculum in the school of civilized discourse; it is also a set of protocols that curb our natural savagery and greed, and cultivate a capacity for sharing and thoughtfulness.
>
> I've had dinners of boiled potatoes with families in Siberia, suppers of deli cold cuts with single welfare mothers in Chicago, bowls of watery gruel in the Sahara—all made memorable by the grace with which they were offered and by the sight of youngsters learning through experience the art of human companionship. The teenagers in *Kids* are not only physically starved...by the junk food they consume... Far worse, they are deprived of the main course of civilized life—the practice of sitting down at the dinner table and observing the attendant conventions..."

What du Plessix Grey calls "the ritual of nutrition," like any ritual, requires sacrifices—it takes time and effort to get dinner ready—but making these sacrifices nurtures both family and society. Cooking and eating together teaches us compassion.

I keep sharing this essay with people because its author has described exactly what I believe: we must value and respect each other, and we learn best how to do this at the table. And since the family meal has become more and more rare, we must start thinking about what the schools can do to teach these lessons. But the schools educate our children as if there were no family emergency on one hand, nor a planetary emergency on the other.

THE GOAL OF EDUCATION

As educators from Socrates onward have recognized, the goal of education is not the mastery of various disciplines, but the mastery of one's self. Being responsible to one's self cannot be separated from being responsible to the planet. I know of no better way to get this lesson across than through a school curriculum in which food takes its place at the core level. From the garden, and the kitchen, and the table, you learn empathy—for each other and for all of creation; you learn compassion; and you learn patience and self-discipline. A curriculum that teaches these lessons gives children an orientation to the future—and it can give them hope.



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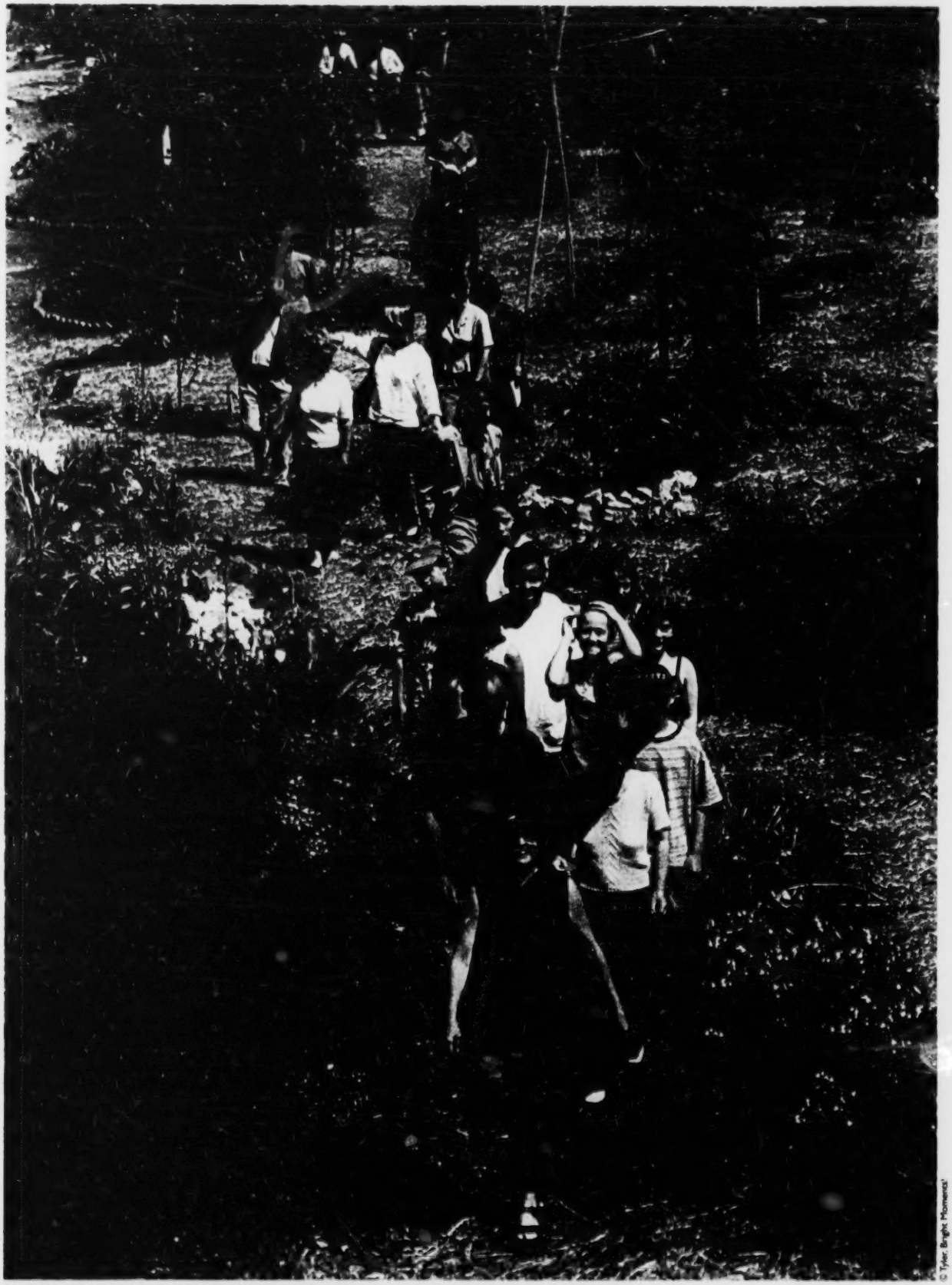
Nimble fingers break open a pod to reveal the fava beans securely tucked inside.

Gardening, cooking, serving and eating, composting—these are truly basic things, but the lessons they could teach are drowned out by the clamor of the media and the insidious temptations of consumerism. Kids today are bombarded with a pop culture which teaches redemption through buying things. School gardens, on the other hand, turn pop culture upside-down. They teach redemption through a deep appreciation for the real, the authentic, and the lasting—for the things that money can't buy—the very things that matter most of all if we are going to lead sane, healthy, and sustainable lives. Kids who learn environmental and nutritional lessons through school gardening—and school cooking and eating—learn how to lead ethical lives.

It doesn't take much persuasion to get schoolchildren to pay attention to a food curriculum. Eating has a natural inevitability: it's something you have to do every day. What's more, eating is something you can do every day that has the potential to bring you enormous pleasure. I realize that our society is uncomfortable with the notion that education might teach our children how to experience pleasure; but the sensual pleasure of eating beautiful food from the garden brings with it the moral satisfaction of doing the right thing for the planet and for yourself.

PLACES OF BEAUTY

Rebuilding the schools so they are physically inviting, and inspiring—and perhaps even beautiful—is more important than wiring them for computers. We cannot expect computers to function as a kind of substitute for schools. Just as agribusiness, processed food, and supermarkets fail to provide the benefits of real communities—the kinds of communities that are nurtured by small-scale local agriculture, home-cooked family meals, and farmer's markets—the virtual classroom can never replace the real classroom in creating a socially responsible public.



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Alice Waters received the John Stanford Education Heroes Award from the U.S. Department of Education.

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Children deserve to be educated in places they can be proud of. It made me feel so good when I was in the garden here at King and I overheard a student say to his friend, "Doesn't our garden look great?" The aim of education is to provide children with a sense of purpose and a sense of possibility, and with skills and habits of thinking that will help them to live in the world. A key way to learn these skills and habits is to learn how to eat well and how to eat right. A curriculum designed to educate both the senses and the conscience—a curriculum based on sustainable agriculture—will teach children their moral obligation to be caretakers and stewards of the finite resources of our planet. And it will teach them the joy of the table, the pleasures of real work, and the real meaning of community.

Alice Waters is chef and proprietor of world famous Chez Panisse restaurant in Berkeley, California, where meals are prepared for 500-600 people per day. She is also the founder of the Chez Panisse Foundation, a non-profit educational organization that "supports youth and community projects that teach people the interwoven pleasures of growing, cooking, and sharing food, inspiring them to respect and care for the land, their communities, and themselves."

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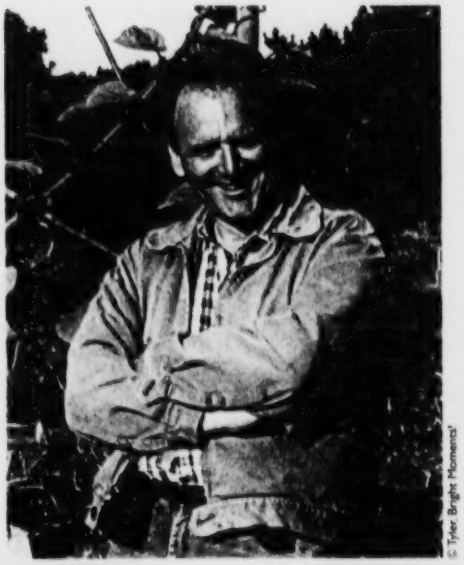
DAVID HAWKINS

The Garden Experience

Creating the garden at the Edible Schoolyard has been an adventure and an act of faith. We started by giving the students the task of building and maintaining the garden. This sent a very powerful message to the students of our faith in their capabilities. Over the last three years 900 students, working with a dozen faculty and more than 100 volunteers, have transformed a derelict piece of land, weed infested and partly covered in asphalt, into a beautiful and productive garden. There is real pride in a cooperative endeavor that has changed not only the land, but also all who have participated. The students are involved in an ongoing relationship with the garden both as creators and observers. It has become a living, collective work-of-art, rather than simply a field in which crops are grown.



David Hawkins

Children and the earth must both be honored in the process of building a school garden. Through the experience of working, playing, and eating together, the Edible Schoolyard aims to create an atmosphere of conviviality, respect for each student, and the enjoyment of the bounty of the earth. It is an approach to education which encourages students to form a bond with nature and truly care about the natural world, as well as know about it.

Experiential education is important. It is the element most lacking for students who have seen everything from an erupting volcano to a total eclipse on TV. Based solely on these electronic images, students think they "know" about nature. The human experience has been shaped and enriched by living amid the beauty and complexity of the natural world. Play once familiarized young people with the elements of the earth: sand, wood, clay, leaves, grasses, and animals. Play also acquainted young people with the enjoyment of human language, companionship, and collaboration. Nowadays play signifies plastic toys and electronic gadgetry and is often a solitary experience. In the Edible Schoolyard

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students have a much-needed chance to experience at first hand sand, clay, mud, humus, compost, water, air, wind, rain, sunlight, insects, spiders, plants, roots, leaves, and sticks.

There are days when the squabbles over who gets which job, the tools that are mislaid or broken, or the jobs that are imperfectly done make gardening with 11- and 12-year olds seem an impossible dream. And yet, there are perfect days. At the end of a hot afternoon, cool from the sprinklers, with the wind moving through the open framework of the *ramada*, and the happy chatter of tired but delighted students, all the elements are there: water, air, the sun, and young humans at their best. The magic of such days makes all the struggles worthwhile.

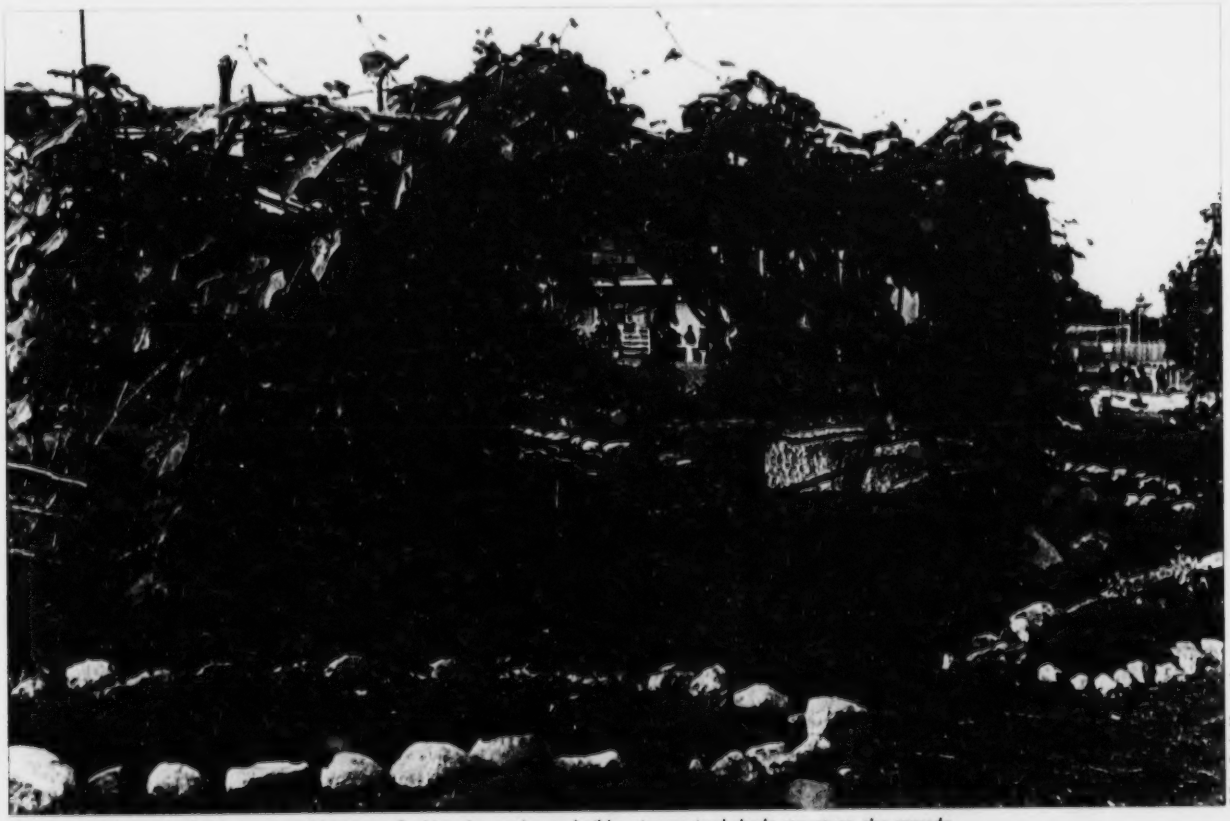
WORKING AND LEARNING TOGETHER

Gardens are a wonderful context for adults and students to work and learn together. A garden is not a space like a classroom where control can be strictly maintained, nor is it a place where children can be forced to do manual work. The students come to the garden with preconceptions and prejudices. Some have already had good experiences with gardens and are interested in plants, doing practical work, and experiencing what the garden has to offer. For other students, the garden is an uncomfortable, bug-infested place where they are expected to do dirty, low-status work without pay. The sustainability of the garden component of the Edible Schoolyard depends on the way students are enabled to relate to their feelings of affinity or alienation in the situation. Much of this does not take place in formal communications between adults and students, but it is played out in countless observations, experiences, and interactions that take place in the garden every day.

Adult appreciation of the students has also been very important: their humor and expressions, their determination, their camaraderie, and their human fallibility. A boy who moved to a different city regularly

returns to check out the garden. When a reporter asked him what he had enjoyed so much about the garden he thought carefully and said, "It was the way the adults treated us."

Very few school gardens develop slowly. All too often they appear overnight, as if by magic, and the process of creating a garden and increasing fertility remains obscure. Students have added almost 130 tons of compost to the garden beds since the inception of the program. Most of this has come from the curbside recycling program of the City of Berkeley. Students also compost food waste from the kitchen and plant material from the garden in the hot composter and



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Students cut branches from acacia and bay trees flanking the garden to build an improvised shade structure, the *ramada*.

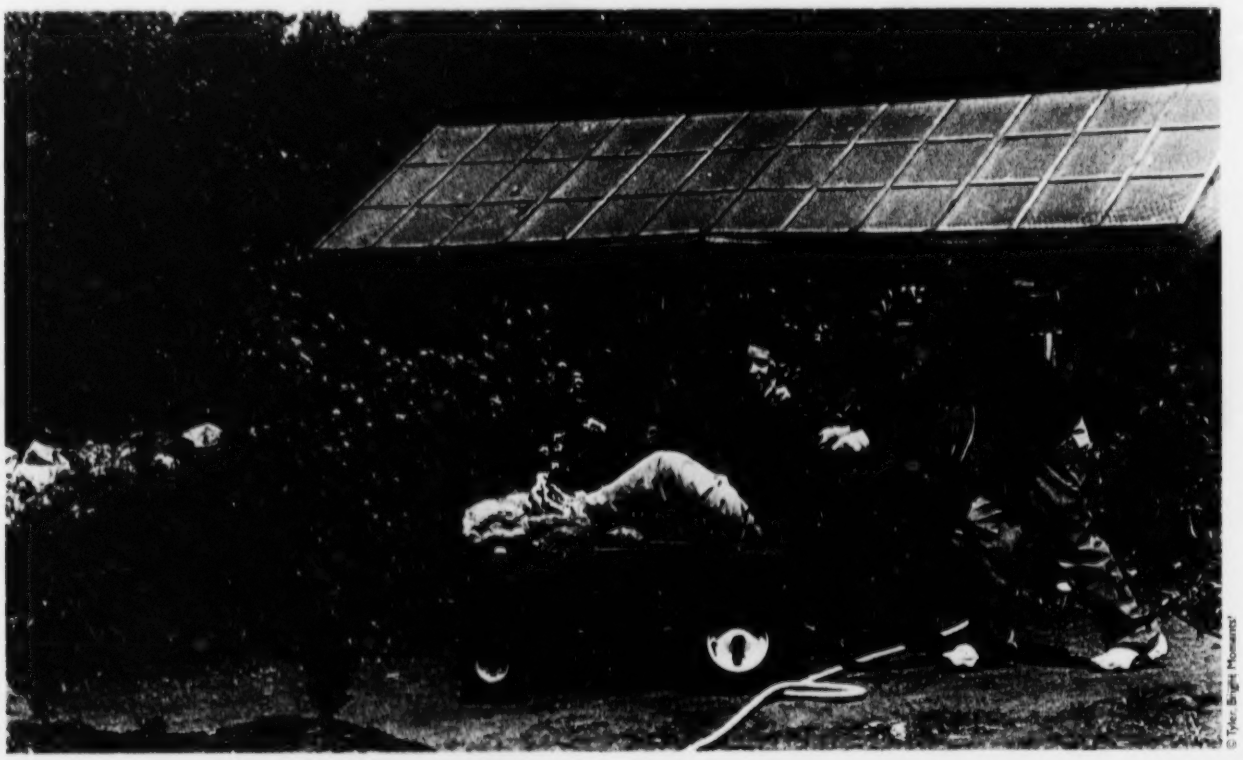
worm bins. Through this process the students experience the cycle of life, death, decomposition, and regeneration. Students and teachers have come to appreciate the importance of organic matter not only for increasing the workability of the soil, but also for increasing its fertility and the living populations of the soil food web.

The garden classes deeply affect many students. They love eating peas from the pods, tomatoes from the vine, or carrots pulled from the bed and washed under the hose. Digging up potatoes, as well as other Andean food tubers like *yacon*, *mashua*, and *oca*, are also favorite tasks. These experiences make a strong impression. Students and faculty have been surprised by the rich diversity of plant varieties and crops being grown in the garden. One girl said that she never knew there could be so many kinds of salad greens or that so many edible plants existed.

A GROWING RESOURCE

Most of the structures have been built from the trees growing around the edge of the garden. For some time there had been discussion of building a shade structure to make the straw-bale circle a more pleasant place for classes to meet on hot summer days. It was the arrival of 10 University of Montana students, who had come to spend a week volunteering, that precipitated building the structure that is now known as the *ramada*. Branches were cut from the acacia and the bay trees adjoining the garden and building progressed in a highly eclectic and improvisatory spirit. Cutting trees has been one of the students' favorite activities. They have been able to observe how slowly trees regenerate after branches have been cut from them. Many students have come to realize that our wood lot could soon become depleted with only a modest program of building structures and using firewood for the pizza oven. Depleting our wood lot would deprive us of valuable shade, habitat for our birds, and wild places on the site.

The garden has come to be a resource not only for the school and the wider school gardening community, but also for the local community. Every day visitors come in a formal, as well as an informal way. People bring their out-of-town visitors; King alumni and parents stop by; families hold birthday parties in the garden or come to simply enjoy it; and unattached teenagers hang out in the garden. There is no fence around the garden. The disadvantages of occasional minor vandalism are far outweighed by the value of community access. Nothing exposes the often latent pride of the students more clearly than when they have the chance to give tours of the garden to visiting adults or students from other schools. Even students who do not seem very enthusiastic about the garden find interesting things to tell and explain to their visitors. The garden is an interface between the school and the wider community.



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Our neighbors give donations of plants, help with watering during the summer, and come to work with students in garden classes. At present we have about 40 volunteers working on a regular basis with students in the garden.

The appreciation people express for the beauty of the garden and the enjoyment people have spending time there is gratifying, but the real success of the project lies in the hearts and minds of the students and faculty at King. In a recent survey of all the students at King, the Edible Schoolyard came third in popularity of all school activities; it followed field trips and PE. Many of the students don't talk very openly about their feelings. However, a boy who was expelled from the school came back the next year to see if he could enroll in the summer project in the garden. And, last year the valedictorian mentioned the garden a number of times in her speech. She said that working in the garden had been one of the most memorable aspects of her time at the school.

David Hawkins has been building the garden at King Middle School with the students and faculty since the Edible Schoolyard project began. A native of England, he has worked for many years in innovative educational programs outside the classroom context, often with boys who have been expelled from school.

ESTHER COOK

From the Kitchen and the Table

On any given day a visitor to the Edible Schoolyard kitchen classroom can witness the intriguing sight of 30 students collaborating to transform their garden's harvest into a sit-down meal. The beautiful school kitchen is a magical place where 300 students a week strike the balance between production and passion. Students undertake the work of learning new skills, following directions, and completing tasks within a set time frame. They display true excitement and ingenuity as they mine each lesson for it's creative potential. Classes are structured in a 95-minute progression involving a brief lecture/demonstration, food

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preparation, setting the table (always with a tablecloth and flowers), sharing of food and conversation, and class clean-up.

Last spring students made pancakes. With one semester of experience they were eager to try making the recipe completely on their own without the teachers' help. Teachers were asked to hold their hands behind their backs, if they needed to, and let the students solve any problems themselves. One 6th-grade teacher confided her fear that her students wouldn't be able to do it, that they would fail, but she conceded, "The worst thing that could happen is that they won't eat pancakes today. Let's just try it."

Nothing was put out on the tables except copies of the recipe. The students had to read the recipe, get the ingredients, and measure them. The recipe called for melted butter, so the students had to figure out how to measure and melt the butter themselves. They had to get out all the equipment and make the recipe.

And they did it! The pancakes from each group came out totally different: some of them were rubbery, others were very, very thin, but the students loved them. And it was interesting to see what they did when they were allowed to do things on their own. One group carefully measured out the batter for each pancake so that they were all even and round, and another was drawing letters with batter into the pan. It was wonderful! The teacher came up afterwards and said, "This has meant so much to me to see these kids be able to do this. I guess I had underestimated them."

The enthusiasm with which students engage in the kitchen is evident in the variety of foods they have made and enjoyed. Past recipes include Jerusalem artichoke fritters, pumpkin and kale soup, cucumber sushi, and sweet potato biscuits. Students grow more than 15 types of salad greens and enjoy an endless array of green salads year round.

Esther Cook

With each visit to the kitchen my students become more confident, more comfortable, and more responsible about using equipment and helping to clean up. Their curiosity about and acceptance of different foods and ways of preparing and serving meals has grown noticeably.

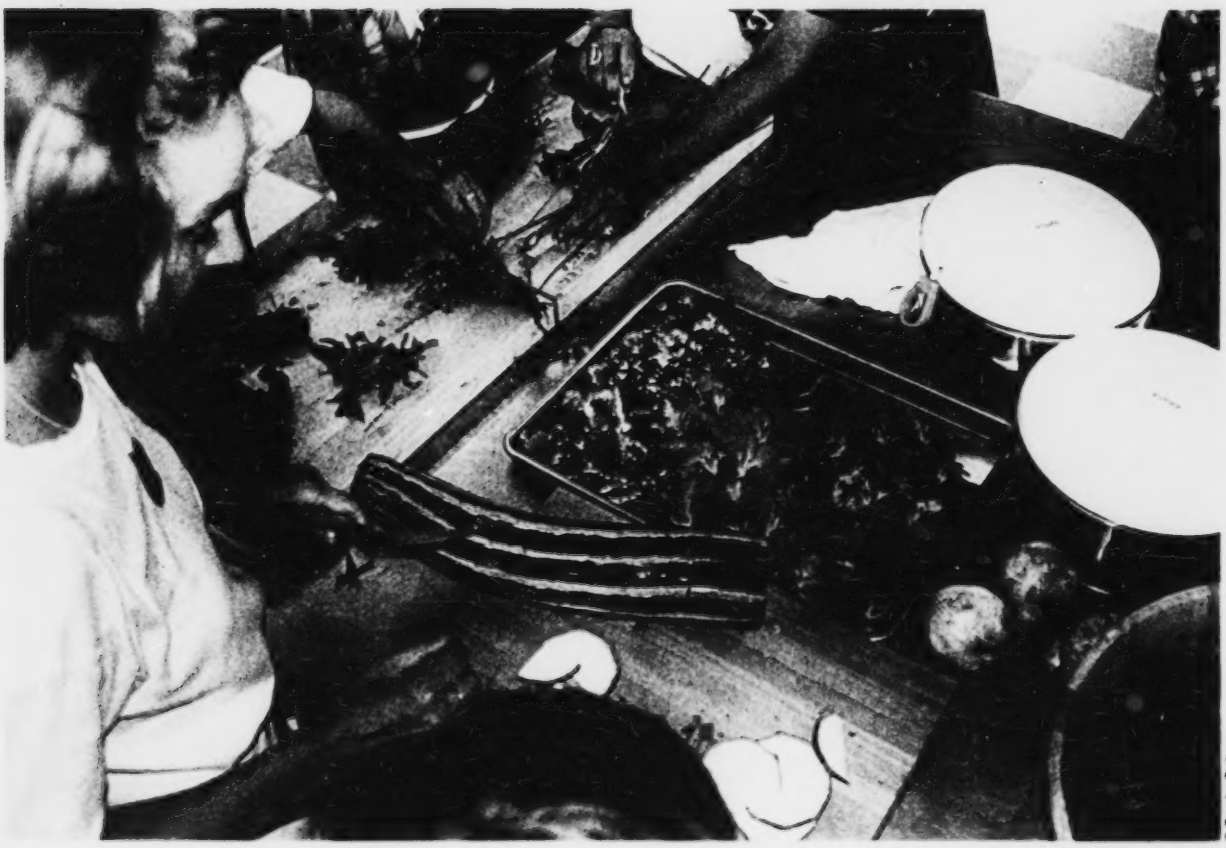
JOSIE GERST

My math classes loved working with food, especially chopping vegetables!

PATSY MCATEER

The potential for learning in the kitchen classroom is limitless. Students have learned the origins of staple ingredients by grinding their own wheat and corn into flour and making butter from scratch. They have appreciated the inherent bounty of the garden by counting the seeds in a cherry tomato. They were struck by the ability of 1 tiny tomato to hold the potential for 100 plants. "Enough for everyone on my block!" exclaimed a student.

Students practice the principles of ecology as they reuse, recycle, and compost. Vegetable tops and scraps become stock, a tin can becomes



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a cookie cutter, and bottles are employed as rolling pins. Students carry produce to the kitchen and scraps to the garden composter, becoming a part of the cycle of regeneration themselves. As they eat their way through the seasons and plan menus in anticipation of crops they have planted, their attachment to the natural world strengthens and grows.

Esther Cook is the teacher and manager of the Edible Schoolyard kitchen classroom. She was raised on a farm in New England and worked as a Bay Area chef for 12 years. Four years of volunteering with Market Cooking for Kids (a collaborative between farmers, chefs, and public schools) inspired her to make the move from restaurant kitchen to public school classroom.

An Edible Schoolyard Recipe: Red Chard Wraps

WHAT DO WE NEED?

Ingredients:
2 bunches of chard
1 bunch of chives
6 cups of cooked rice
½ cup of currants
2–3 tablespoons olive oil
salt & pepper to taste
soy sauce

Equipment:
1 rondo*
1 pair of metal tongs
small mixing bowl
1 wooden spoon
1 teaspoon
10 soup spoons
paper towels
1 large sheet pan
4 paring knives
cutting boards

*A rondo is a large cooking pot that looks like this:

• For a group of 10 students

WHAT ARE WE MAKING?

Red Chard Wraps

What is that?

Chard is a leafy vegetable. It comes in red and green. We are going to cook it and fill it with rice salad. Then we will wrap it up like a present and tie it with a chive, which is an herb that grows like grass.

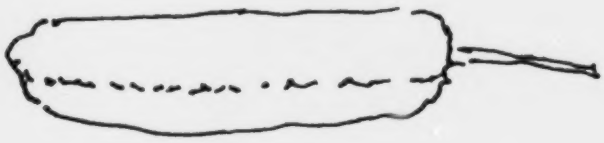
Method:

Place approximately 3 inches of water in the rondo and bring to a boil. Wash chard in cold water and shake off any excess water. Blanch chard in boiling water by placing leaves in a few at a time. Use the metal tongs to do this. Cook chard leaves for 3–4 minutes. While they are cooking, line a sheet pan with paper towels. Use the tongs to remove the chard from the rondo. Drain the leaves on the lined sheet pan. Blanch the chives using the same method. Set aside chard and chives.

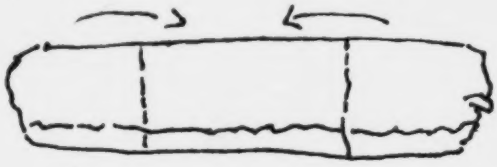
Combine the rice, currants, and olive oil in mixing bowl. Add salt and pepper to taste. Now we are ready to assemble the wraps.

Place a chard leaf on the table. Using a teaspoon sprinkle a small amount of soy sauce on the chard. Use a soup spoon to place rice salad in the middle of the leaf—about 2 spoonfuls.

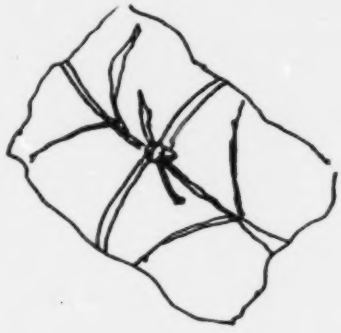
Fold the sides into the center the long way like this:



Trim off the stem and fold the ends toward the middle, like this:



Use a chive to tie your wrap around the middle. This will keep it from coming unfolded.



Cleanup:
Wash, dry, and put away all tools and utensils. Sweep around your station if needed.

Set the table:
Use a tablecloth, small plates, and cups. Please make a centerpiece using produce from the harvest table.

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A budding chef uses metal tongs to gently place a chard leaf in boiling water.

© Tyler Bright Moments!

Nimble fingers deftly tie the chard wrap together with a chive.

INTERVIEW CONDUCTED BY LESLIE COMNES

Nurturing a Climate for School Change

© Tyler Bright Moments

Neil Smith

I understand that you started here at King as principal in 1989, having been in administration for 10 years before that. What were some of the challenges you faced coming into the school?

When I had arrived at King, the school had been through a number of principals in a short period of time. Teachers did not feel supported at the school and felt that their voices didn't matter in the operation of the school. Student discipline was poor, and the buildings and grounds were in terrible shape.

I tried to help teachers see that we could do something about all of this. If we worked together and set goals as to what's important to us, and had agreements about that, we could change the school. But, we couldn't change it overnight. Each year we could add something new to our list, but to think that in one year, or even two years, everything was going to be wonderful would be very foolish.

As a way to help teachers feel supported, one of my first goals was to get student discipline in hand. At that time, the school was a two-year school, and I expected that the 8th graders who had already been there a year would resist the new limits I set. I expected that they would never give in, but neither would I, and we would battle the whole year. I also expected that by the end of the year we could make a major impact in that area. And we did. But it was a year-long battle and was a very tough year for me.

What else did you do to help teachers feel as though their voices were heard?

At the first staff development day we had in the fall, I divided the staff into four groups to look at the problems that the school was experiencing, such as academic failure and behavior. I asked each group of about 10 teachers to examine the problem and to come up with some

plans for looking at that issue. When they came back, one of the groups reported that our school needed a revolution. So, a group began to work on the revolution and we set up the Revolutionary Committee. The committee was designed to be a fluid group of the faculty so anyone could come. It met after school and chose and defined the problems that it would address. At the beginning, there were about a dozen people who came—more than a quarter of the staff. After some initial venting, the Revolutionary Committee began to focus on solutions. The committee would research and seek solutions that it would then bring back to the whole staff.

© Zenobia Barlow

Breaking the ground for the tool shed, principal Neil Smith lends a hand and helps students dig in.

When a staff becomes as large as the staff at King [50 teachers], to try to hammer things out at a faculty meeting is a laborious process and it frustrates people. The Revolutionary Committee puts in the time and the effort to work a problem through and then runs it by the staff to be critiqued. By the time the committee presents an idea to the staff, they've spent a lot of time working on the issue and getting a lot of input, a lot of shaping from the staff.

How does the Revolutionary Committee help shape the school?

The first year the committee got some things going for the next year and teachers really felt a part of the process. They didn't feel that anybody had forced the ideas on them, and they felt responsible for the programs that we were implementing. Anything that was put into place

© Zenobia Barlow

The garden presents authentic opportunities for students to apply the math that they learn in the classroom.

that impacted the school as a whole was approved by the faculty as a whole.

With the Revolutionary Committee in place, people saw that things were beginning to work that first year. The committee became a part of the fiber of the school, although some years its spark is greater than others. It seems that when the staff perceives more problems, more people attend the Revolutionary Committee, and when things are going well, fewer people come. However, this can slow down the reform effort, for dissatisfaction with the status quo often spurs people to move more quickly into reform.

We looked at our block schedule a number of years ago through the Revolutionary Committee. In 45 minutes, say, you feel like you are racing in and racing out. When you have a 95-minute period you can actually have time to do things with your class. I think the block schedule is what makes our garden and our kitchen work so well. Even walking to the garden can take 15 minutes with organizing your class, focusing them on task, and letting them know what you are going to do.

So in the midst of all this change at the school, you read Alice Waters' interview in the paper where she commented on the physical deterioration at King. You called her up and invited her to talk with you. Was it at that meeting when the idea for the Edible Schoolyard came about?

When I met with Alice, she already had a vision of a school garden, and of integrating the garden into the school lunch program, with students using the fresh produce to make lunches. I saw her idea as one that would empower kids, one that could positively impact the school climate and the school curriculum. It seemed to make a lot of sense to me. It wasn't something I had considered before, but I thought that it really could enhance what we had going already and could make King a better school for the kids who come here.

© Tyler Bright Moments

Beebo Turman and her daughter, Brenna

The idea excited me, but it was also overwhelming. I didn't think I could create this project and run a school at the same time. I knew I needed someone to make this project happen—ideally a parent in the PTA who would work with Alice. I put the idea out at the PTA meeting but there was no response. I tried again the following fall, and Beebo Turman, a parent, became excited about it.

Next I talked to the faculty about it, to see if there were teachers interested as well. It definitely sparked the interest of two of our science teachers—Phoebe Tanner and Beth Sonnenberg. But Alice's vision was so far reaching and so "out there" compared to where we were. She was talking about students serving other students lunches that they had grown in the garden, and we were looking at an asphalt, urban lot that looked so bleak. People told me it was really far out—I had to agree. I even told Alice that she was jumping to step 10 before we had even gotten to step 1! We needed to start with the garden before we could talk about the cafeteria and redoing the lunch program. Well, pretty soon there was a garden and then a kitchen. And now we are talking about a dining commons that's being planned!

How have you helped people see the vision to get to where the Edible Schoolyard is now?

As school people, we know that there are a lot of big ideas that come along. I think that someone has to break the ideas down into steps that most people can at least envision. To put out to everybody the idea of students serving lunch to one another was a bit far out even for most of our faculty, and I think for most parents, but to put out the idea of a garden—they could envision that. Now when I discuss the idea of kids serving lunch to each other, it's not so far out anymore. Now they see that they've come this far.

So you build on your successes. But there has to be some measurable, noticeable success that people can stand on before they go to the next step. Then people can say, "Okay, now this is what we see. And yes, there is this overarching vision of where we are going."

So, initially, most people saw it as "We're getting a garden"?

Yes, people could buy into the garden. Talking about building on success, a couple of years earlier, we had transformed another area of the playground—an equally horrific urban lot—into a baseball field. By using outside resources such as the North Oakland Little League and the Berkeley-Albany Softball League, along with the PTA, the school had dug up the old asphalt and put in grass and a baseball diamond.

© Tyler Bright Moments

The garden is emerging from the interaction between the land and the students who are building and tending the garden.

So when we put out the idea of having a garden, people could imagine that. People looked at the baseball field, and there wasn't a feeling of hopelessness about the garden. They had seen one patch of land transformed, maybe this other patch of land would be transformed, too.

Although people would buy into the garden, they would often say, "Come on, you're going to grow produce? Kids are going to cook it? Give me a break." I'd just say, "Let's talk about that after we get the garden."

In the beginning, then, you had a few people who were excited and motivated about the garden. How did you move from that to buy-in from the rest of the staff?

A key to the buy-in has been not forcing people to do something they don't want to do. People have said to me, "You're the principal, can't you just make the teachers do this?" Well, no, you can't. And not only that, you don't want to. Because when people are forced to do something, they don't do it well. In order for something like this to be successful, the teacher has to want to do it. If the teacher wants to do it, it's going to catch on with the kids.

When a decision involves everyone school-wide, we take a faculty vote. I look for such a sizable majority that those in the minority feel like, "The tide is moving against me. I've got to turn and go with the tide." On crucial issues, such as the double-period block schedule or implementing an organizational binder, you need buy-in from everybody and it has to be at least 80 percent if you are going to make it work. I look for 80 percent in those votes. We use a secret ballot, and I always let people know the exact vote. With other issues that are really just preference issues—like whether an assembly happens second period or fourth—then we go with a strict majority, 50 percent.

An example of getting buy-in would be what happened with the double-period schedule. The first year, the science department agreed to try double periods for a year. We needed another department to go with them, so we could put those two classes back-to-back on the schedule. History agreed to try it for a semester, with the understanding that they would vote at the end of that time; if they voted to go back to traditional, we would. At the end of the semester, the history department voted 50-50 to stick with it. I told them that since science wanted to stay with it, and they were just 50-50, we would stay with it through the year and then decide what to do the next year. They were okay with that.

After that the English and math departments came to me and said they wanted double periods the next year. We had a faculty meeting to talk about what we were going to do: We could have two departments out of six on the block schedule, but we couldn't have three or four departments without the others.

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Students built bean poles and a kiwi trellis and they designed informal beds and plantings that developed an aesthetic of their own.

© Tyler Bright Photography

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At the meeting I threw it open for their ideas. The science department said they would never go back to 45 minutes again. History agreed! I was so surprised, but by now they had more than half of the department who really liked it. English and math had already said they wanted to go with it. PE said they didn't want it but they wouldn't block it. That left the electives department. Two electives teachers objected, and one of them said it was probably not the best thing for a foreign language. I would agree, but you have to look at the school as a whole. The level of French and Spanish we are teaching is so elementary that three days a week would suffice. So we took the vote, and the staff voted overwhelmingly for it.

We were nervous about it. We spent time at our staff retreat in August planning how everybody would teach for 95 minutes. It took a while to adjust, but there was buy-in, and now there is no thought of our schedule running any other way.

Did you have a faculty vote like that for the Edible Schoolyard project?

With the Edible Schoolyard, it was slightly different. It didn't require buy-in from everybody because it didn't involve everybody. So the question for the staff as a whole was, "Here's a project that is going to go on; what do you think?"

When we make staff decisions, we sometimes use a method with eight levels of voting. This gives people a way to express their concerns, their reservations, and even their negativity toward an idea without blocking it. A person can say, "All right I'll go along with this idea. I don't like it, but I don't want to stop anybody else; and so, all right, you have my grudging 'yes.'"

The Edible Schoolyard really only impacted those teachers who were taking their kids out to the garden, primarily 6th-grade science teachers.

The garden has provided my students and me with many unexpected wonderful experiences. Working in the garden, getting our hands dirty, problem solving, communicating, cooperating and simply having fun in an alternative learning environment has been increasingly rewarding.

LYNNE PACUNAS

© Tyler Bright Moments

Students helped shape the joints of the toolshed designed by Scott Constable.

Those teachers really wanted it, and I think among the rest of the staff there were varying views: "Nice idea, but I don't want to be involved," "We don't want to stop you, enjoy it," or "At some point I might like to be involved." I also think there was probably some skepticism as to what would happen. I don't think that anyone realized how it would run, how big it would become, or how successful it would be.

With the staff willing to try the project how did things begin to get rolling?

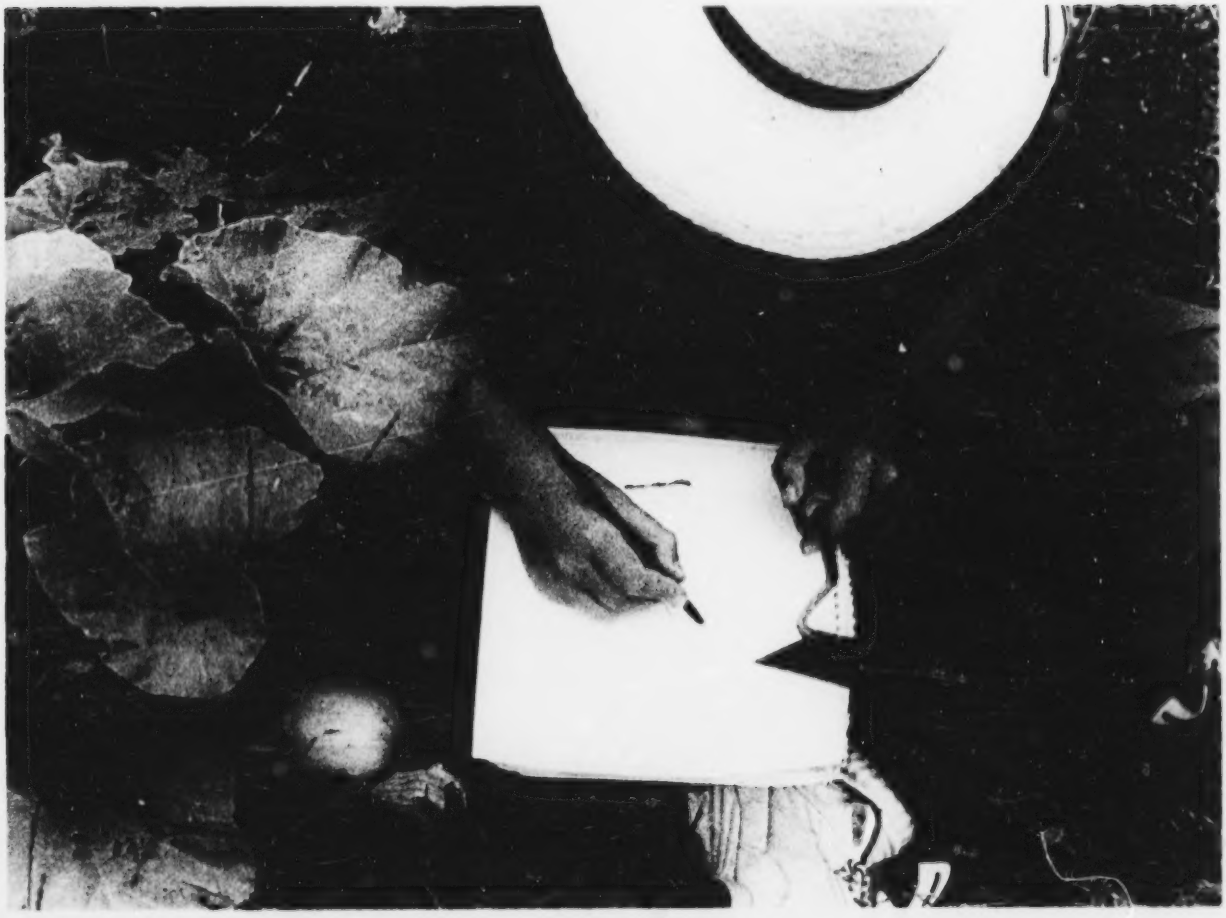
In about March of 1995, we had a charrette and invited different people to come to the school—landscape architects, teachers, restaurateurs, food growers, and others. We asked them how to make the project happen. Out of that meeting, we selected our site from three possibilities. Through some connections we got someone to take the asphalt out. It's a toxic substance so it has to be properly removed.

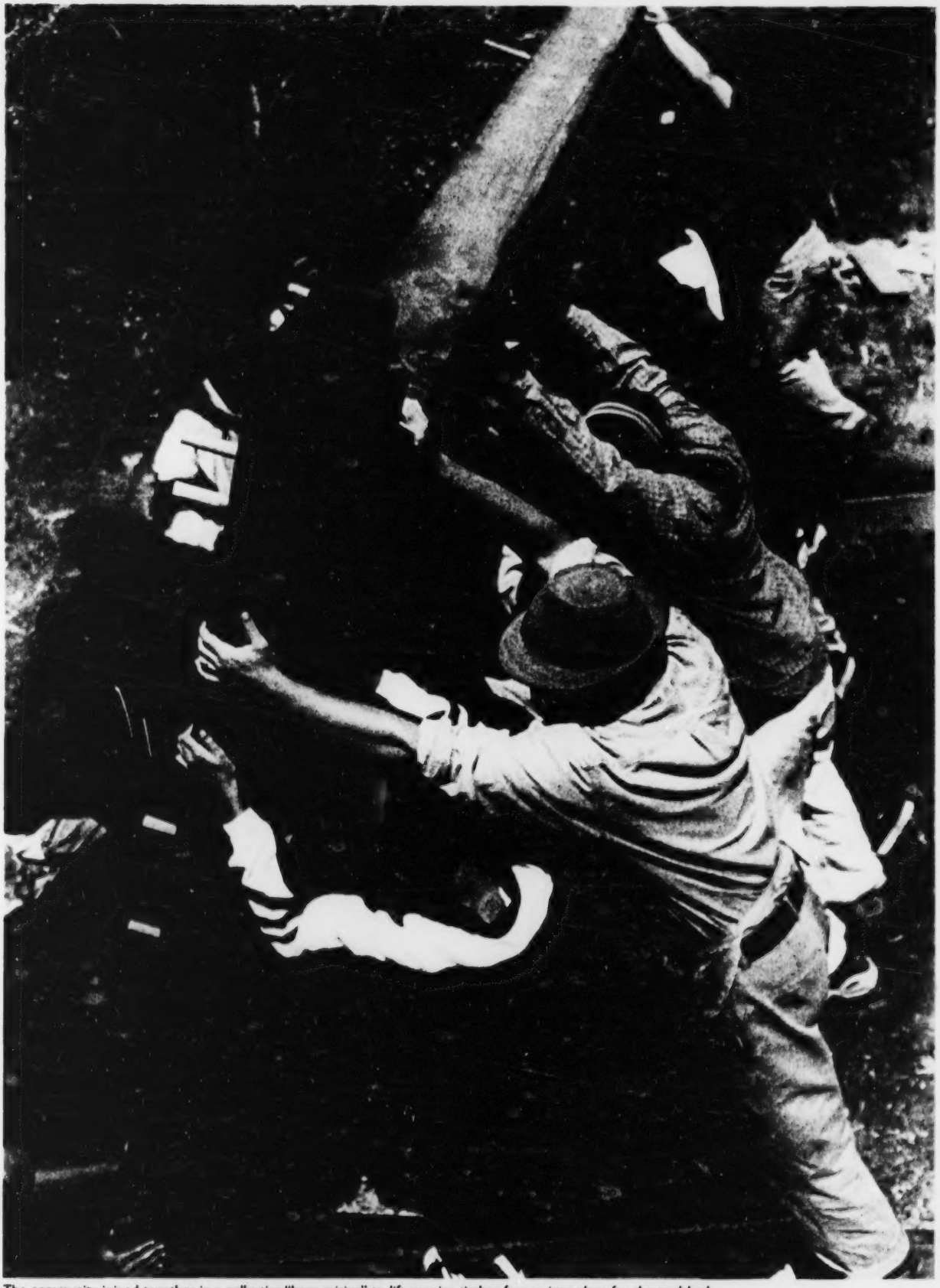
However, even though we got rid of the asphalt, the soil was not good. So, in December of 1995, we had a planting. We invited people connected with the project to come to throw the first seeds. We made it ceremonial, with an Aztec dance group. They were drumming while we got lines of people to walk along and toss seeds as they went. The seeds were primarily fava beans, to put nitrogen back into the soil and to cleanse the soil.

A lot has happened with the Edible Schoolyard since you planted those first seeds in 1995. At first, just a few teachers took their kids out to the garden. As the garden grew you added Edible Schoolyard staff. Then the kitchen came along in 1997, which has brought in other classes and other teachers to the project. And now you are in the midst of planning a school dining commons and garden kitchen that will make the project even more a center of the school. Are there teachers who are thinking, "Whoa, what happened?"

Yes, there probably are. But they also can see that the program is so successful and that it is obviously having such a good effect on the kids.

The garden teachers who went out initially worked through a lot of the bugs, so that the second wave of teachers using the garden benefited from the initial teachers' experiences. These first teachers have been very good about sharing their experiences and about doing staff development. For example, they put together a panel of different teachers—including seasoned veterans—who have had good experiences in the garden. When someone who has taught at King for more than 20 years sits up on the panel and talks about how it has worked for her and how successful it has been with her kids, that speaks to the whole faculty.





The community joined together in a collective "barn-raising" to lift massive timber frames into place for the toolshed.

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The support that you have given teachers for this project is impressive, like making sure that there is staff to manage the garden. In other schools, teachers try to run the school garden in addition to their classroom duties, and that can get frustrating.

You have to compare the garden to every other good resource you have at your school, like the computer lab, for example. The computer lab becomes more successful and better used when there is a computer technician and instructor already in the lab. With this support, teachers have someone to help them to plan the lesson, to set things up in advance, to trouble-shoot, and to make sure things are kept up. The same is true with the library. You can have this wonderful resource, but without a librarian, it just won't be used as well. The same is true with the garden. Just having the resource there is not enough. Having the personnel is critical to making the thing work.

With the garden, if you have to go out ahead of time to plan it, well, then you don't go. And if the garden is not just yours, but you are sharing it with other teachers, it changes even more. For it to work effectively you need that garden coordinator whose job is to facilitate the success of the garden program.

One thing that I have been struck with is the tremendous amount of communication among teachers and support staff that seems to be involved in making this project work.

Yes, the teachers and staff initially involved have spent a tremendous amount of time talking things through and getting things to work. The Center for Ecoliteracy really recognizes the need to do that. They've given us a grant to allow teachers to develop curriculum, and to create the position of mentor teachers. Those mentor teachers help to shepherd their colleagues through the process. That's important, too.

I've found that kids who have recently immigrated here are eager to share their knowledge of food and growing food in their former homes. I remember one student in particular who described his grandmother's garden in Mexico. He noticed that many of the fruits, vegetables, and herbs that we grow here are similar to those his grandmother grows. For this student, the garden provided a sense of familiarity and created a bond that is a valuable stepping stone towards building a sense of community.

KELSEY SIEGEL

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How does the Edible Schoolyard fit into your notion of school reform?

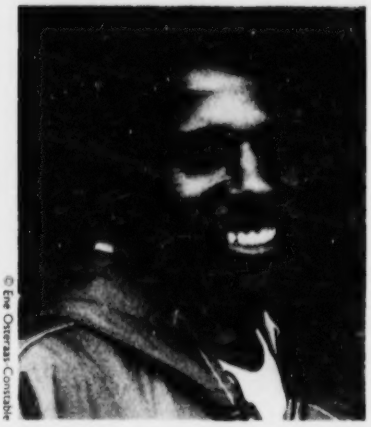
For a project like the Edible Schoolyard to happen, there has to be a climate at the school where the ideas of reform are viewed positively. And reform doesn't have to start off in a big way. Sometimes when people talk about reform, it frightens people. But you have to build on small successes. You can look at something that's manageable, that's doable, and that's attractive to a lot of people; when you are successful with that, then you move to another step, and then another. When you build on other successes, people's visions begin to expand. They begin to say, "We CAN do this."

I think if 10 years ago I had come to King and said, "We're going to build a school that has a garden in the back, that has a baseball field over here, we'll have a double period schedule," you know, I wouldn't have lasted a year! Everyone would have thought that I was some crackpot coming in. And, what's more, I know that my vision would not have specifically included all those things.

My vision was definitely a reformist vision, but it was broad enough that it could encompass a lot of ways to get to the end. The end has always been clear to me: that every kid is buying into his or her education, is excited about learning, is treated well at school, and feels safe at school; and that every teacher is empowered to help design and create this learning community. But I am open to getting there through lots of different paths. I don't say, "This is the way we have to go." I assume that lots of people bring lots of ideas and that the collective group is smarter than anybody in the group. By putting ideas through the group, we hone them, make them workable for everybody, and get buy-in from everybody, too.

The Edible Schoolyard project influences styles of instruction, structures, and relationships. It has led us to ask: What is the nature of learning?

YVETTE MCCULLOUGH



© Eve Ostergan Constable

Steven Davis

The kitchen door is always open—we find this helps build a sense of community. The kids feel free to come in anytime to look for a recipe or sit down and talk with us. In addition to my work in the kitchen, I also am a PE coach. This additional work with the kids really helps reinforce the rapport we have in the kitchen.

STEVEN DAVIS

From what you are saying, reform is happening at different layers at King. You are talking about the school being a place where kids feel safe and engaged, and it also seems important for the teachers to feel safe to express their ideas.

Oh, yes. That's what the Revolutionary Committee is for. People bring forth some pretty wild ideas, and no matter how far out an idea seems, it gets considered. Alice's idea initially seemed pretty far out, frankly, given an urban school. Kids serving each other lunch, growing their own carrots—that was pretty wild. But a lot of things we have at King would have seemed wild to people there 10 years ago. Teach kids for 95 minutes? We used to think they couldn't sit that long. And now, we don't even talk about it. It's part of the culture of the school.

What are some other ways, would you say, that the culture of the school has changed?

The culture has changed drastically, which has been responsible for other things changing as well. The culture of the school is now one where there is a lot going on for kids—a lot of learning—and it's going on in exciting ways. There is also a feeling among the staff as a whole that we are all responsible for the kids as a whole. I don't think there is anyone who now would just look at their room, at just their own students, or at their own curriculum. Everyone has an understanding of the big picture and feels some responsibility for it.

The Center for Ecoliteracy talks about this shift from the parts to the whole which seems to be a critical element in reform.

That's a big shift. It's also part of middle school reform in particular. Middle school reform is about moving away from that high school model, where I as teacher am responsible for presenting my subject to my students. It makes middle school more like elementary school, where you continue to nurture students—not pamper them as babies.

but nurture them as learners—and help them in the growing process. We have a staff of teachers that is really committed to this particular age level. They really want to be at middle school.

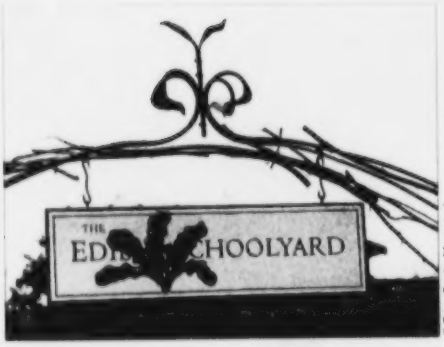
How has the Edible Schoolyard helped in building community?

King feels more like a community than it did a few years ago, due to a number of projects, the garden being one of them. It brings people in who may not be interested in tutoring, or reading, or coaching, but who are interested in getting involved. I think the neighbors and the community really like the Edible Schoolyard. Rather than seeing a desolate landscape, they now see a beautiful garden. It has enhanced the image of the school in the neighborhood.

The sense of community goes beyond the school only because it happens within the school. Among the staff there is a real sense of community. Teachers feel respected by one another even if their opinions differ. They feel that their ideas will at least be considered, if not accepted. Among staff there is a real caring about one another, and a sense that we are all working together for a big common purpose.

What advice would give to someone embarking on a project such as the Edible Schoolyard?

First of all, you need to understand that it's not going to happen in a year, that it's a long-term project. Second, you don't have to have buy-in from the whole staff initially to get started, but you do have to have a few committed people. Third, it's good to look for support both inside and outside the school, at least initially, to make it work. You need district support. Our superintendent, Jack McLaughlin, has been very supportive, and this is especially important if you are going to be using part of the land at the school. Finally, there has to be support for the teachers who participate, support in various ways like time to meet or a person who is out there guiding them.



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I work with nine students ranging from 11–15 years of age. These students have learning disabilities, come from the inner city, and have had little, if any, exposure to the earth and how things grow. The kitchen and the garden are things that these kids can do well in; our garden work, in particular, there is carry over from the garden to the classroom. When we studied ancient man last year, we made baskets from grasses around the garden, we talked about food, the differences between hunting and gathering and learned about domestication of plants. The garden provided a hands on experience for the kids to make a connection to what they were learning in the classroom.

ELIZABETH WEIR

How have parents responded to the Edible Schoolyard?

There was a worry initially that some parents might say, "You are taking away from 'real curriculum' so that my child can spend time in the garden." It was a fear that hasn't really materialized. It has come up with the occasional parent, but it has been rare. On the other hand, we've had many parents say, "My child's favorite thing about the school is the garden." Parents, of course, are pleased when their kids are happy about something at school, especially 6th, 7th, and 8th graders who are rarely happy about anything. So that has been satisfying to hear.

Have you heard from the students directly about what they think of the project?

Every year we have to survey our students as part of the Berkeley Schools Excellence Project. This spring we got close to 600 responses. Students complete a two-sided survey, and on the back side they have to list the top 6 things they think should be priorities for funding at the school. They have 35 possible choices. At our school, the most votes went to PE/sports, the second most was for field trips, and third was for the garden—out of 35 possibilities! That was quite a testament from the kids' point of view–that the garden is something that they value.

Have you noticed any difference in things like test scores or other academic assessments?

Can you prove that it's making a difference? I don't know that you can. What the Edible Schoolyard has done is it has helped change the culture of the school. It grabs kids' interest in school by giving them a hands-on experience with their peers and their teachers. It pulls kids into the school, into learning. And it makes kids realize that learning isn't just books, but that life is about learning.

50

One of the tasks of middle school is to excite kids about learning, and the Edible Schoolyard is successful there. If at the end of a child's 8th-grade experience, the child has certain facts down, well how long will those facts be remembered? But if the child is excited about a particular subject, he or she is going to become a real student and go on learning about it. That's really what you want to do—in middle school in particular—isn't it?

Neil Smith has been the principal at King Middle School for 10 years. He credits King's talented teachers and an enlightened and supportive community for creating the Edible Schoolyard project and for sustaining its growth.

Leslie Comries is an education writer specializing in science and environmental education. She has written for *Project Learning Tree*, *Project WILD*, and *Life Lab Science*. An avid gardener and former teacher, she is always interested in how educators engage learners and help to connect learning to their everyday lives.

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INTERVIEW CONDUCTED BY LESLIE COMNES

A Conversation with Educators

© Zenobia Barlow

Beth Sonnenberg and Phoebe Tanner

. . .ON BUILDING COMMUNITY

Beth Sonnenberg: One thing that is so nice about the Edible Schoolyard is that it builds community in a way that makes your life so much easier as a teacher. It gives you a common place with your kids that is not contrived. Kids at this age do not like "touchy-feely" stuff and working together in the garden is a concrete way to get at some of their issues.

I remember once there were only two kids in my class who had never been tool librarians, but these two disliked each other and didn't really want to work together. I said to them, "Well, you both want to do it, so why don't you go in there and see what you can do to work it out." And when they came back to the circle at the end that day, they said, "You know what? We were an excellent team!" One was a better reader; so she filled out all the names and checked out the tools, and the other tidied up the tool shed and put everything away.

That opportunity to work together would never have worked academically because they were at opposite ends, but they actually had skills that worked beautifully for that situation. And they both felt really positive about the fact that they had made it work. That kind of thing is helpful because it breaks down what's between the two of them in the classroom. They now know that they can work together on a math assignment, even though they are on different levels.

A teacher might think, "Oh, I'm giving up an hour and a half of curriculum time for the garden." But, you are gaining it really.

Akemi Hamai: At King, we have this huge heterogeneity. We have kids who are at a college reading level, whose parents are professionals, and who have a lot of resources; and then we have kids who don't

have a lot of resources, who have had really negative school experiences, or whose parents didn't graduate from high school. And basically these kids are thrown together. We can't teach them like they are all the same—they are not the same! At King, all the students are mixed together not only at the same school, but in the same classrooms.

So, as teachers we are always looking for different things that all kids can get a lot out of academically, emotionally, and socially. We look for ways to bring the students together. We have all tried cooperative learning activities, but the kids know they're contrived. So, we are looking for natural, authentic ways for all kids to have a successful experience.

The Edible Schoolyard brings kids together because they work together for a reason. They want to eat in the end, so they'll work with this group of kids who they may not ever socialize with or know anything about. Or they'll work together to build a shade structure. It is a natural way for everyone to learn together and to work together; a way that everyone can enjoy.

Phoebe Tanner: Even the way we have the garden set up can help students see that they are part of the school community. At home, you plant a tomato seedling, you water it every day, and then you pick and eat the tomato. Here it's done communally so that one class may prepare the bed, another class may plant the seedlings, and then a different class may harvest for the kitchen.

We did have a problem one year when a group of girls claimed the strawberry bed as their own. They prepared the bed, they planted it, they weeded it, and then they thought the strawberries should be theirs. Other students, following common practice, helped themselves to the ripened fruit. The girls became very upset and there were a number of arguments. We're working on finding ways to let students

Working in the garden allows my special education students to explore the beauty of science and math in a cooperative setting. We have built fences, cut and measured the branches, and problem solved how to build stronger fences. Some days we take our chalk and paper out to the garden and draw. One of our most enjoyable experiences is walking through the garden and talking.

JENNIFER BROUHARD

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Akemi Hamai

develop a personal relationship with the plants, and yet keep the sense that it is everybody's garden.

Beth Sonnenberg: I had two boys who never said anything, they were just so quiet. One time they were given the job of pruning the hedge along the fence, and they both took shears and they went over there. And they were in dialogue for an hour and a half, having a conversation. I don't know what about, but every time I looked over there, they were talking and pruning, and I just thought, "Great!" because both of them really needed to be heard. They were paired up beautifully. And then shortly thereafter they started going with each other to see movies, and they talk on the telephone.

So some really nice things happen in the garden and in the kitchen because there is space for things that might not happen in the classroom. That's where I see the real value.

Akemi Hamai: Some of the most successful kids in the garden or the kitchen are the ones who do the least amount of homework and other work for me. The garden or kitchen is the place that they love. And seeing them there changes the relationship between me and my students. Even with a kid who doesn't usually do homework, I can see that this kid is a great worker; he or she knows a lot, or is really interested. Or, we might have a wonderful conversation about the child's family's garden, or his or her grandmother who gardens, or someone who lives in whatever country the family may have come from who gardens. There are so many connections we can make, and that has been really nice for me.

I do my best to try to connect with these kids, and this is just another way to do it. The garden and the kitchen are great places to see these kids be successful. I think that changes the teacher's attitude—it has to—and it changes the kids' attitude: how they feel about themselves and how they think you see them. And at this age, that is key for these kids.

Tyrrah Young: The kitchen offers the students within the Opportunity Class (an in-school alternative program) a chance to work together in a more intimate environment. These particular students, I feel, give voice to the food connection and family ritual. Food is a big part of the kids' lives. Some of them take on the responsibility of both feeding themselves and possibly a younger sibling at home. Our kitchen experience gives us a chance to talk about the eating habits of family and friends, as well. For some students, the kitchen experience provides an opportunity to demonstrate their expertise. It also allows them to experiment in various ways with foods they might otherwise never eat at home.

Tyrrah Young

The kids get very involved in the preparation. For example, when my class made the red-chard wraps, they added their own creative touch. Some of them were not "big" on the wrapping part, so they came up with their own modifications. Some used the chard leaf as a tortilla and placed the filling on top. Some ate only the filling, leaving the leaf. Others created their own ideas about what the filling should or could contain. This is very typical of what happens when we enter the kitchen. We can get really creative with the recipes because our group is so small.

Phoebe Tanner: Last year one of my classes had a number of conversations about work when we were in the garden circle. The conversations started when an African-American student told the class, "My grandmother says, 'Hard work is a responsibility.'" He repeated his grandmother's words on many different days.

Another student in that class, started a ritual in the closing circle when he said, "I just want to say that Frank worked really hard today." Others followed with stories about fellow classmates' accomplishments and the practice continued throughout the year.

One student was reluctant to work. She would sit on a bench complaining or maybe talk to a friend. After a couple of months, I noticed that she was loading wheelbarrows full of compost, smashing old concrete

The kitchen is the ideal heterogeneous classroom. It's the one place where all the kids are equal. The kids are open, respectful, willing to share, some kids really blossom here.

ADA WADA

with a sledge hammer to make a wall, and listing her accomplishments in the closing circle. When I asked her about it, she said, "I just decided if we were going to be out here, I might as well work." I saw her today and told her I was thinking again about how her participation in the garden had developed. Through a laugh she said, "I love the garden."[7]

Joy Osborne: I've been involved with the Edible Schoolyard project since its inception. At first, my primary interest was looking for ways to enhance my students' understanding of the Neolithic period. We looked at how agriculture first began, and the domestication of plants and animals. As a kitchen extension, we ground different kinds of grains. Over time, I began to see that there was much more going on—we were cultivating a sense of community through our kitchen work.

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When we worked in the kitchen we were coming together as a kind of family. We prepared food together and worked together in healthy ways. It was not so much *what* we were making, as *how* we were doing it. In our kitchen work we were building a sense of community.

. . .ON INTEGRATING CURRICULUM

Beth Sonnenberg: The state mandates so much curriculum to be taught. It's really difficult to be on top of it and to be pacing yourself to get through the entire math and science curriculum. It's even harder to do that and then to add something else, like the garden. So you really have to find where the ties are. Integration helps in finding ways to accomplish this.

In science, we really tried to look at the tie-ins to what we already were teaching. Where do we already teach certain things and how do they tie into the garden? When I taught landforms, for example, and we were looking at erosion, I looked for a spot where I could see erosion in the garden and we talked about which size particles traveled the farthest. When we studied levers and pulleys, we looked at tools in the garden and at mechanical advantage and leverage of the tools. One year we had to move a plant seed tray table, which was really heavy. We tried to move it with an Egyptian method of rolling. Where they used logs, we used irrigation pipes.

Akemi Hamai: I just happened to be doing a unit on genetics at the same time that the apple trees were being grafted in the garden. The timing was just lucky, but I rearranged my schedule to talk about the genetics of grafting, and things like cloning. It worked nicely.

The apple grafting happened then because it was the right season and those particular dates were when we could get volunteers. It wasn't like there was a specific plan to tie it into the curriculum. But, that's our

Randa Chas

In history we talk about resilience and discuss why a system needs diversity. We talk about landscapes, about the human impact on the land, and about adaptation. I want my students to feel empowered to change the world. I don't want them to feel as though they are just a cog in some machine.

RANDA CHAS

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Patty Fujiwara

goal, that the curriculum can be flexible enough that we can take advantage of wonderful teaching moments like that.

Phoebe Tanner: At the heart of the project is one of life's most basic functions: nourishing ourselves. In the growing, cooking, serving, and eating of organic, delicious food, we are feeding the bodies, minds, and spirits of our students and ourselves. As teachers, we are working to bring to light the ecological understanding that comes from growing and eating healthy food. In turn, it is our hope that kids will learn how to care for the earth.

Esther Cook: In the kitchen we used math to cost out meals, which was very interesting to these kids. They are very savvy about money, because they either have a lot of it or they don't have enough of it. When we costed out meals, the kids started to realize how they could make money. We figured out if you make soup for 30 people and the ingredients cost, say $7, and you sold the soup at, say $3 a bowl, how much money you could make. The profit margin loomed in their eyes, and they were saying, "We could all go to Great America [amusement park] at the end of the semester with the money we earned just by selling soup."

Akemi Hamai: We didn't want the Edible Schoolyard to be just for science, we wanted it to be for everyone, so that means there are all these other classes that have access to the garden. They don't go out in a scheduled way, but one art teacher who is close by, for example, has brought her kids out to do sketching. Other teachers have done that, too, and use the garden either as a nice setting for the kids to be in or as actual material for them to work with.

Genevieve Leslie: The Humanities teachers saw a lot of opportunities for integration of social studies in the kitchen. At the beginning of

this school year, we really tried to establish the kitchen as a classroom. One example of integration was to set out our three kitchen tables to represent three cultures that the students would study. They had to guess the cultures based on the foods and cooking artifacts on the table. This really gives kids the chance to approach what they learn in the classroom from a different angle, one that is very visual and very tactile. At the end of each study of a culture, the kids make different dishes from that culture; then we have a feast to celebrate.

Randa Chas: In 7th grade we study World History. When we studied the Middle East the kids made pita bread with hummus in the kitchen. At the end of our studies, the students wrote essays or short stories based on what they had learned. When we were brainstorming topics for their writing, students knew details about life in the Middle East, like the types of food people eat.

Beth Sonnenberg: I have heard that a good teacher is one who can come up with a million examples for one idea. The garden is a seemingly endless source of examples that I can draw on repeatedly in my teaching. The garden is a rich, common experience that helps me in teaching so many science concepts. Some of my kids have never been across the Golden Gate Bridge, while others have traveled the seven continents. But, they've all been to the garden.

Phoebe Tanner: I teach a unit on trash in which students investigate how much trash the school produces and how much trash the City of Berkeley generates. We study the state mandates for trash reduction. We visit the transfer station and the recycling centers. We look at nature's recycling in the garden through composting and vermiculture. As in the garden, this is an area where kids can impact the environment. Every time we buy something, we are making some kind of decision. Whether we

One of the values of working in the garden with middle school students is that it can get them working toward a common goal, whether it is removing a stump or planting a bed. They work with kids they otherwise might not get to know. The garden helps build a sense of camaraderie and community among my students.

PATTY FUJIWARA

Community response to the Edible Schoolyard has been tremendous! Several hundred people visited us last year, looking for ways to create similar programs in their neighborhoods. Visitors come away with ideas, inspiration, and most importantly, a sense of what is possible. Instead of feeling guilt or frustration about the state of the environment and education, people see that they can actually create simple, positive changes in their own neighborhoods and schools which will have a lasting impact.

ENE OSTERAAS-CONSTABLE

buy juice in a squeeze-it plastic bottle or in a recyclable glass container; whether we buy organic apples or apples sprayed with pesticides, we are making decisions that affect our environment.

Esther Cook: When students were learning about Egyptian home life and how the Egyptians used to cook breads on a stove, we made pita bread in the kitchen. They read about Egyptians eating fenugreek, and we went out and picked fenugreek and made fenugreek tea. When the winter Olympics were going on in Nagano, we cooked a traditional Japanese breakfast, with udon noodles and miso soup.

The more links you can make for these kids the better. They want relevancy; they want to know how what we do at school translates into their everyday lives. What could be more relevant than growing, cooking, and eating food?

Ene Osteraas-Constable: Last summer there was a girl in the program who was so cynical about the garden, she didn't even want to be there. The last day I started a natural-dye project, where we used different materials from the garden to make dyes. All of a sudden she came up to me and she said, "Look at this bougainvillea. It opens up like this. See how all these parts work together? If you open it up, there's no color in the center." She hadn't even looked at the plants before, her eyes were literally glazed over. She hadn't participated in the garden at all, but she found an entry point. Since that time, I've noticed that she is now able to relate to more aspects of the garden. It's relevant to have different entry points, and that's where the interdisciplinary aspect of this project really fits in. Without that you are really limiting the possibilities.

. . .ON CHANGING A SCHOOL CULTURE

Akemi Hamai: It is an amazing effort to pull off a project like this, especially in a middle school where there are academic departments,

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scheduling complications, and teachers who are very confident in their subject matter, but who are not necessarily generalists. There's a tremendous amount of coordination involved. As a faculty we have had to learn to communicate with each other—constantly and at a level we would never have considered before. We have to really communicate to see that we are really pulling the pieces together.

Beth Sonnenberg: The reason that the Edible Schoolyard project can work at our school is that our school is amazing in and of itself. It would be fine without an Edible Schoolyard project and still a very distinguished school; this is not the only thing happening. Most of our staff is doing extra duty in a major way. There's the Lit Pal program where students write to adult pen pals in the community about books they read. There's also a Family Writing program. There are very dedicated teachers at this school and they all do more than just teach in the classroom.

Akemi Hamai: The garden enhances the school culture, but the school already had the staff and mentality to make a project like this successful. It does change the school in some ways, but the school staff was already ripe for that. Working with the Center for Ecoliteracy has helped the staff clarify our goals, and helped us to put the goals into a framework that everyone understands. It has challenged us intellectually, which I think our staff enjoys.

Beth Sonnenberg: Sometimes it is hard having a program that is really for the whole school. We have to work to find ways to involve all the staff in it. Not everyone has the expertise—or the same level of interest.

Phoebe Tanner: People come in with their own views and there has to be room for that. There have to be entry points all along the way; and different kinds of entry points so that not everyone has to subscribe to one way of doing things. It's important to be sensitive to all people's positions.

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Ene Osteraas–Constable

YVETTE MCCULLOUGH

Developing Ecoliteracy

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Yvette McCullough

At King Middle School, ecology permeates the things we do. It is our way of explaining to students what we do and why we are doing it. We don't teach just one unit on ecology, we approach ecology as the thread that holds everything together.

The garden presents opportunities to make the principles of ecology important to kids. Kids learn to understand the link they have to the earth. With the garden, as teachers we don't have to preach ecology from a soapbox, we can get the kids involved. Sustainability no longer is something the teacher talks about, it becomes something the kids experience.

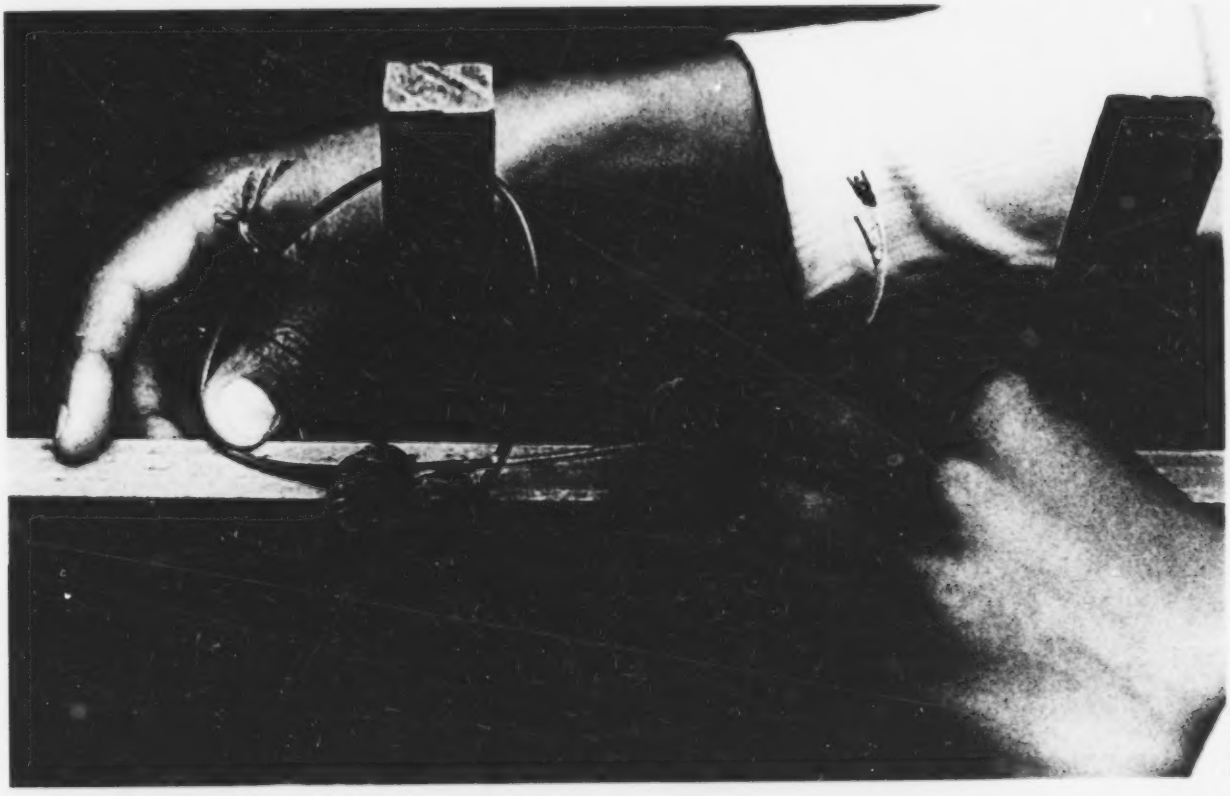
We use ecology to explain the "why" behind the science we are doing in class. We teach a lot of science at King; ecology brings a science topic into the real world and gives it relevance for the kids. For example, someone might ask why we are doing experiments on photosynthesis. If we look at photosynthesis through the lens of ecology and with a garden context, we have an answer that means something to kids.

With both a kitchen and a garden, we are reminded of the reality that we are sustained by plant growth, not supermarket food wrapped in plastic. Kids see where food really comes from. They experience the impact their own actions can have. They see what they can do. They feel empowered that their actions can make a difference.

The Edible Schoolyard has an impact on the school culture and the way we interact with the kids and each other. As a staff, we all work together. To enhance our own understanding of ecology, we meet and educate ourselves. We evaluate what's important and how we can make a difference. This approach has enabled us to see changes in how we interact with the kids and how the kids relate to each other. In this way, the Edible Schoolyard is a living entity. It's the way we work and interact.

Living things evolve. We see ourselves that way, too. It's not that the Edible Schoolyard has arrived and is fixed in time and place. We see the Edible Schoolyard as an evolving process—one that will continue to grow and change over time.

Science teacher Yvette McCullough brings a life-long commitment to ecology to her teaching. In her sixth year at King, Yvette is involved in curriculum development for the Edible Schoolyard project. As a mentor, she is dedicated to increasing teacher participation across the curriculum, as well as increasing parent and community involvement.



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Principles of Ecology

Ecological concepts that are the patterns and processes by which nature sustains life.

NETWORKS

Interdependence, Diversity, and Complexity

The members of an ecosystem are interconnected in a vast network of relationships in which all life processes are interdependent and achieve stability through a diversity of linkages.

NESTED SYSTEMS

Boundaries and Limits

At all scales of nature, we find living systems nesting within other living systems, each within its own boundary and limits.

CYCLES

Recycling of Resources and Partnership

The interactions among members of an ecological community involve the exchange of resources in continual cycles so that all waste is recycled through pervasive cooperation and countless forms of partnership; on the planetary scale, each of the elements vital for life goes through a closed loop of cyclic changes.

FLOWS

Energy and Resources

The constant flow of solar energy sustains life and drives ecological cycles, all organisms feed on flows of energy and resources, each species producing output that is food for other organisms.

DEVELOPMENT

Succession and Co-evolution

The unfolding of life, manifesting as development and learning at the individual level and as evolution at the species level, involves an interplay of creativity and mutual adaptation in which organisms and environment coevolve.

DYNAMIC BALANCE

Self-Organization, Flexibility, Stability, and Sustainability

All ecological cycles act as feedback loops so the ecological community regulates and organizes itself, maintaining a state of dynamic balance characterized by continual fluctuations.

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FRITJOF CAPRA

Creativity and Leadership in Learning Communities

Fritjof Capra

Martin Luther King, Jr. Middle School in Berkeley is an ideal example to illustrate the multiple facets of ecoliteracy. Being ecologically literate, or "ecoliterate," means understanding the basic principles, or core concepts, of ecology and being able to embody them in the daily life of human communities. For learning communities, and for schools in particular, this requires a new way of thinking and a new practice of leadership. In the learning community at King Middle School, the new thinking and the new leadership are both practiced in exemplary fashion.

Ecological thinking means thinking in terms of relationships, connectedness, and context. In science, this kind of thinking has become known as "systems thinking," or "systemic thinking," because it originated in new scientific approaches to the understanding of living systems that were developed during the first decades of this century.

In my book, *The Web of Life*, I trace the history of systems thinking through this century and propose a synthesis of several systems theories that emerged during the past 25 years. In other words, I present a new conceptual framework for the scientific understanding of life. This new understanding of life has some very interesting implications for the understanding of creativity and leadership. In this article, I shall explore these implications, illustrating them with some examples from King Middle School.

LIVINGS NETWORKS

One of the important early insights of systems thinking was the realization that every living system is a network. This idea appeared first in ecology. From the beginning of ecology, ecological communities have been seen as consisting of organisms linked together in network fashion through feeding relations. At first, ecologists formulated the concepts of food chains and food cycles, and these were soon expanded to the contemporary concept of the food web.

The "web of life" is, of course, an ancient idea, which has been used by poets, philosophers, and mystics throughout the ages to convey their sense of the interwovenness and interdependence of all phenomena. As the network concept became more and more prominent in ecology, systems thinkers began to use network models at all systems levels, viewing organisms as networks of organs and cells, just as ecosystems are understood as networks of individual organisms. This led to the key insight that the network is a pattern that is common to all life—wherever we see life, we see networks.

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Now, although all living systems are networks, we know that not all networks are living systems. So, what are the characteristics of living networks? One of the most important features of all living networks is that they involve feedback loops. In a living network, there are many cycles and closed loops, and these loops can become feedback loops. A feedback loop is a circular arrangement of causally connected elements, in which an initial cause propagates around the links of the loop, so that each element has an effect on the next, until the last "feeds back" the effect into the first element of the cycle.

In an ecosystem, feedback loops tend to bring the system back into balance whenever there is a deviation from the norm, due to changing environmental conditions. For example, if an unusually warm summer results in increased growth of algae in a lake, some species of fish feeding on these algae may flourish and breed more, so that their numbers increase and they begin to deplete the algae. Once their major source of food is reduced, the fish will begin to die out. As the fish population drops, the algae will recover and expand again. In this way, the original disturbance generates a fluctuation around a feedback loop, which eventually brings the fish/algae system back into balance.

The feedback phenomenon is extremely important for all living systems. Because of feedback, living networks can regulate themselves and can organize themselves. A community, for example, can regulate itself. It can learn from its mistakes, because the mistakes will travel and come back along these feedback loops. So, the community can organize itself and can learn. Because of feedback, a community has its own intelligence, its own learning capacity.

So, networks, feedback, and self-organization are closely linked concepts. We can say that living systems are networks capable of self-organization.

I try to teach ecology differently from the way I was taught it: not piece by piece, but through a systemic approach. For example, we look at how our actions affect other systems, whether it is a soil system or our community and our social interactions. In this way the kids are learning concretely how their actions affect others, and not learning in an abstract way how the actions of one species in an ecosystem affect other species. For me the reason I teach is the hope that through the kids' experience with the earth they eventually will become stewards of the earth.

KAREN HANSEN

NETWORKS OF CONVERSATIONS

Now we can ask: what is the nature of the links in a living network? The answer will depend on what kind of living system we are talking about. In a cell, the links are chemical processes that interconnect all cell components. In the brain and the nervous system, the links are the anatomical structures of the vast neural network, the billions of axons and dendrites. In an ecosystem, as I mentioned before, the most important links are the feeding relationships—the many ways in which plants, animals, and microorganisms feed on one another.

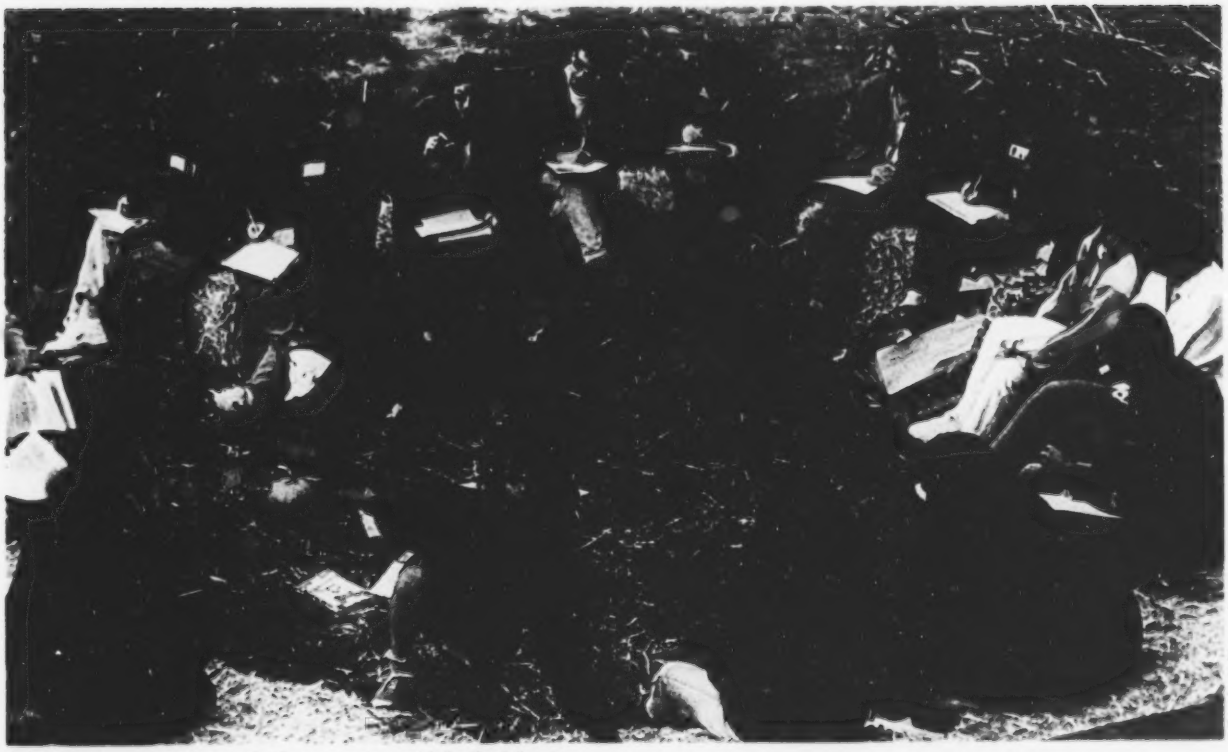
What are the links in a human community? Well, there has been a lively debate among scientists about how to best describe social networks, and one of the most interesting theories is one by a German sociologist, Niklas Luhmann, who describes a human community as a network of conversations. This network involves multiple feedback loops. The results of conversations give rise to further conversations, which generate self-amplifying loops. Thus an off-hand comment may be picked up and amplified by the network until it has a major consequence. The closure of the network within the boundaries of the community results in a shared system of beliefs, explanations, and values—often referred to as the organizational culture—which is continually sustained by further conversations.

A living community is a network of conversations with feedback loops, and one of the best ways to nurture the community is to facilitate and sustain conversations.

Indeed, building community by facilitating conversations was one of the first and most important tasks Neil Smith pursued when he became principal of King Middle School in 1989. He met with all teachers individually in long conversations. He facilitated dialogues, and he organized a two-day staff retreat in his second year, which was attended by 90%

of the faculty. When the Edible Schoolyard project began, he made sure that the first group of teachers who pioneered the project had ample opportunity to share their experiences during staff development days. "The teachers most involved have spent a tremendous amount of time talking things through and getting things to work," Neil told us.

In these conversations, Neil Smith continually encouraged feedback, for example by introducing a sophisticated method of voting, involving eight different levels, which "gives people a way to express their concerns, their reservations, and even their negativity toward an idea without blocking it."



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A living community is a network of conversations with feedback loops.

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It is interesting that networks of conversations are now also widely discussed in business circles. In an article entitled "Conversation as a Core Business Process," Juanita Brown and David Isaacs report that they asked hundreds of executives and employees to describe the quality of conversations that had a powerful impact on them.

They found that the answers they received had a number of common themes. For example:

- There was a sense of mutual respect between us. We took the time to really talk and reflect about what we each thought was important.
- We listened to each other, even if there were differences.
- I was accepted and not judged by the others in the conversation. We explored questions that mattered. We developed a shared meaning that wasn't there when we began; and so on.

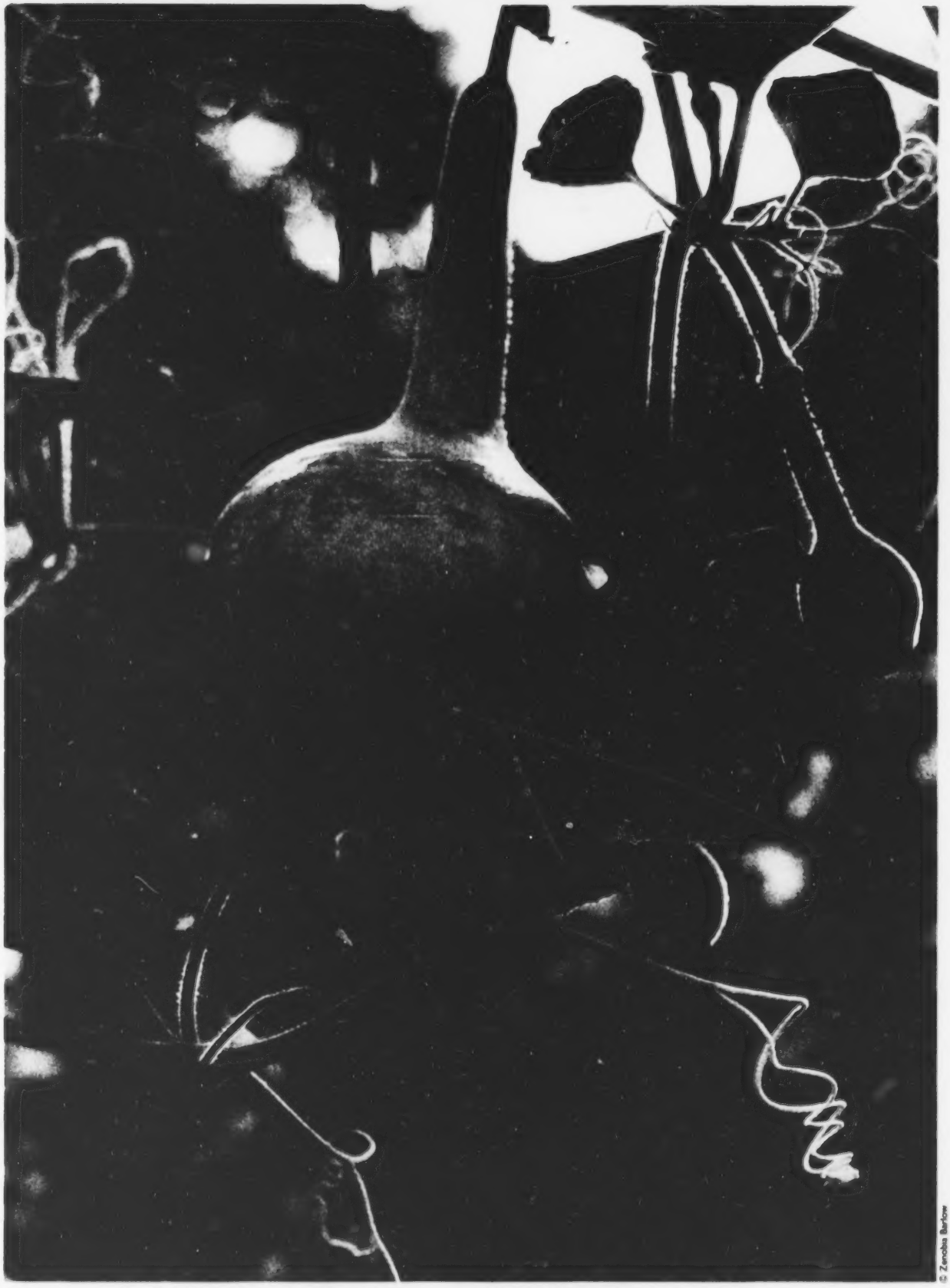
The authors also mention an interesting study by the Institute for Research on Learning in Palo Alto about how learning takes place in an organization. The study concludes: "The most powerful organizational learning and collective knowledge sharing grows through informal relationships and personal networks—via working conversations in communities of practice."

EMERGENCE

There is another very important property of living systems, which has been identified and explored only very recently. Every living system occasionally encounters points of instability at which some of its structures break down and new structures, or new forms of behavior, emerge. The spontaneous emergence of order—of new structures and new forms of behavior—is one of the hallmarks of life. This phenome-

I joined Americorps and came to the Edible Schoolyard so I could encourage students at King to develop a sense of place within their own community. By learning to grow their own produce and creatively landscape an ever-evolving garden, the students at King are provided with a place and experiences that connect them with the beauty of their community and the world that they will inherit.

KELSEY SIEGEL



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non, often simply called "emergence," has been recognized as the basis of development, learning, and evolution. In other words, creativity—the generation of forms that are constantly new—is a key property of all living systems. Life constantly reaches out into novelty.

Detailed studies have shown that the points of instability, at which emergence occurs, are the result of small fluctuations that are amplified by feedback loops. Think again of the off-hand comment in a network of conversations! So, the feedback loops in the network are critical for the system's creativity, and this creativity is manifest in the processes of emergence.

EMERGENT AND DESIGNED STRUCTURES

During the long history of evolution, all living structures on the planet evolved through emergence in a never-ending display of creativity and adaptation. In other words, all non-human structures on the planet are emergent structures. I said, "all non-human structures," because with the evolution of the human species, structures of another type were created. In human evolution, language, abstraction, conceptual thought, and all the other characteristics of human consciousness came into play. This enabled us to form mental images of physical objects, to formulate goals and strategies, and thus to create structures by design.

In human organizations, both types of structures are always present. The designed structures are the organization's formal structures, which are depicted in its official documents and describe the organization's mission, its formal policies, its strategies, and so on.

In addition, there are always emergent structures. These are the organization's informal structures—the alliances and friendships, the informal channels of communication (the "grapevine"), the tacit skills and sources

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of knowledge that are continually evolving. These structures emerge from an informal network of relationships that continually grows, changes, and adapts to new situations.

The two types of structures—designed and emergent structures—are very different, and every organization needs both kinds. Whereas designed structures cannot grow, emergent structures are adaptable, develop, and evolve. They are expressions of the organization's collective creativity. The Revolutionary Committee at King Middle School provides a vivid example of an emergent structure. It emerged from an informal discussion group during the early days of Neil Smith's principalship; its membership has always been fluid and voluntary; and thus the committee is flexible and adaptive and has evolved in response to the learning community's needs.

If we think of the relationship between emergence and design in terms of a continuum, we can say that a system "drifting" too far toward design will become overly rigid, unable to adapt to changing conditions.

On the other hand, if an organization drifts too far toward emergence it will lose the ability to efficiently produce goods or services. The designed structures enable the organization to operate according to certain specifications. They allow the formulation of the rules and regulations that are necessary for the day-to-day management of the organization. So, the challenge for any organization is to find a creative balance between its designed structures and its emergent structures.

LEADERSHIP

It seems that two different kinds of leadership correspond to these two types of structures. The organization's mission is generally the result of a design process. The traditional idea of a leader is that of a person who

is able to clearly formulate this mission, to sustain it, and to communicate it well and with charisma. The other kind of leadership would be the facilitation of emergence. This type of leadership is not limited to a single individual. In self-organizing systems, leadership is distributed, and responsibility becomes a capacity of the whole.

From my perspective, the principal of King Middle School embodies both kinds of leadership. He is clear about his vision, and yet he does not impose it on the staff, but facilitates the emergence of processes and structures that support the vision. "The end has always been clear to me," Neil Smith told us, "that every kid is buying into their education, is excited about learning, is treated well at school, and feels safe at school. But I am open to getting there through lots of different paths... People have said to me, 'You're the principal, can't you just make the teachers do this?' Well, no, you can't. And not only that, you don't want to."

In fact, Neil has recognized that two interconnected levels of emergence are at work here. "In order for something like [the Edible Schoolyard] to be successful," he explains, "the teacher has to want to do it. If the teacher wants to do it, it's going to catch on with the kids."

As we have documented in this booklet, the idea of the Edible Schoolyard has indeed caught on in a big way with the teachers and with the children. And this has changed the culture of the entire school, as Neil Smith points out: "The culture of the school is now one where there is a lot going on for kids—a lot of learning—and it's going on in exciting ways. There is also a feeling among the staff as a whole that we are all responsible for the kids as a whole."

Leadership, then, consists in continually facilitating the emergence of new structures and incorporating the best of them into the organiza-

Jay Cohen

The Edible Schoolyard project gives kids the opportunity to nurture a living thing and watch it grow and, perhaps more importantly, to be able to be really successful at something.

JAY COHEN

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tion's design. In such an organization, there will be a continual interplay between emergence and design. How does one facilitate emergence? You will facilitate emergence by creating a learning culture, by encouraging continual questioning and rewarding innovation. In other words, leadership means creating conditions, rather than giving directions. As Neil says, you can't make teachers do something, and what is more, you would not want to!

Above all, facilitating emergence means building up and nurturing a network of conversations with feedback loops. The first step toward this goal might be loosening the designed structures and thereby creating more flexibility, as Neil Smith did when he first divided the staff into groups to examine the school's problems, and then facilitated the emergence of a flexible and adaptive committee from these groups.

Another important aspect is creating an emotional climate that is conducive to emergence. This means a climate of warmth, mutual support, and trust, but also a climate of passion with plenty of opportunities for celebration. Indeed, celebration—of planting and sowing, of eating together, of friendship and cooperation—has become an important part of King Middle School.

Finally, we need to realize that not all emergent solutions are viable. Therefore, a culture fostering emergence must include the freedom to make mistakes. In such a culture, experimentation is encouraged, and learning is valued as much as success. One of the main problems, in business as well as in education, is that organizations are still judged according to their designed structures, not according to their emergent structures.

As our society goes through the profound transition from a mechanistic to an ecological paradigm, from fragmented to systemic thinking, the

new leaders will need to function, for quite a while, with one foot in each paradigm, so to speak. At the end of our conversation with Neil Smith, we asked him how he measures success at King Middle School. "The Edible Schoolyard...has helped change the culture of the school," he replied. "It grabs kids' interest in school by giving them a hands-on experience with their peers and their teachers. It pulls kids into the school, into learning. And it makes [them] realize that learning isn't just books, but that life is about learning."

Fritjof Capra, Ph. D., physicist and systems theorist, is a founding director of the Berkeley-based Center for Ecoliteracy. He is the author of three international bestsellers, *The Tao of Physics*, *The Turning Point*, and *Uncommon Wisdom*. His latest book, *The Web of Life*, was published in October 1996.

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Members of the Center's regional network of educators came together to share their experiences on a visit to a local organic farm.

A Time-tested Recipe

One of the most rewarding challenges for educators is to create learning communities in schools that foster children's experience and understanding of the natural world. As we have seen in the pages of this book, King Middle School is one example of a community of educators meeting this challenge.

The Edible Schoolyard project at King is unique, a one-of-a kind collaboration of remarkable people; and yet, this evolving experiment embodies basic elements, like the simple, fresh ingredients in a time-tested recipe inherited from our grandmothers.

Zenobia Barlow

One essential ingredient is strong leadership with a clear vision. Principal Neil Smith calmly inspires confidence in the King faculty, and creates conditions within the school for innovation. The seeds of Alice Waters' "delicious revolution" find fertile ground cultivated over time by a dedicated staff. Other essential ingredients include a rich web of relationships, a community working together on a tangible project that fosters both an experience and an understanding of the natural world. By growing and cooking their own food, students are introduced to the cycles and seasons of their place, and the ecosystem in which it is embedded.

The Center for Ecoliteracy is honored to be among a core group of funders committed to the fruition and sustainability of the Edible Schoolyard. We produced this publication as a tribute to the "delicious revolution" occuring at King, and as an encouragement to others who are willing try their hand at this basic recipe, making adaptations appropriate to the local conditions of their own climate and terrain.

Zenobia Barlow is executive director of the Center for Ecoliteracy in Berkeley, California. She is also a visual anthropologist and photographer who documents traditional people at worship, and the reverence and awe she sees in the faces of children in nature.

About the Center for Ecoliteracy

MISSION STATEMENT

The Center for Ecoliteracy is dedicated to fostering experience and understanding of the natural world.

A public foundation, the Center for Ecoliteracy (Center) supports educational organizations and nurtures communities in schools that teach and embody ecologically sustainable ways of life. The Center acts as a grant-making organization, sponsors donor-advised funds, and shelters projects consistent with its mission.

CENTER FOR ECOLITERACY NETWORK

We convene our network of grantees in an ongoing cycle of seasonal retreats and educational experiences. The Edible Schoolyard project is one vital node in this vibrant network of schools exploring the natural world and its enriched contexts for learning.

LEARNING IN THE REAL WORLD®

The Center acts as a publishing resource under the imprint, Learning in the Real World®. As a publishing resource, the Center provides consultation, editorial, design, and production services, and access to the Center's growing archive of photographic images of children learning in the real world.

PUBLICATIONS

The Edible Schoolyard is the second in a series of publications that illustrate diverse efforts in fostering ecological literacy through gardening, cooking, sustainable agriculture, and habitat restoration.

Getting Started: A Guide To Creating Gardens as Outdoor Classrooms. The tried and true techniques presented here are based on Life Lab Science Program's 20 years of experience in helping teachers establish school gardens. Lavishly illustrated with delightful black-and-white photographs of children engaged in the exploration of their gardens, this informative booklet covers everything from outdoor classroom design and site selection, to strategies for gardening with students, to creating community support that will sustain a school garden program. The Center provided Life Lab Science Program with design and production services and the use of images from its photographic library. *Getting Started* was selected by the California Department of Education as a key resource in support of the Department's vision of "a garden in every school."

Ecoliteracy: Mapping the Terrain. Using a Bay Area watershed restoration project funded by the Center as context, this book of collected essays by Fritjof Capra, David Orr, Jeannette Armstrong, and others brings breadth and depth to what is meant by "fostering ecoliteracy." The essays address

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the "process of fostering ecoliteracy" from different perspectives, including systems theory, systemic school reform, and an ages-old technique perfected by indigenous people for building sustainability principles into community process. Vivid images capture the enthusiasm of the children exploring their local watershed.

SELECTED PROJECTS

Berkeley Food Systems Project. The Edible Schoolyard has inspired, and been inspired by, the district-wide Berkeley Food Systems Project, an effort to revitalize the Berkeley Unified School District (BUSD) food service, create a garden in every school, implement innovative food-related curriculum, and increase reliance on regional sustainable agriculture. With 85% of farms facing extinction on the edges of urban sprawl, linking schools to farms will, in author Wendell Berry's words, "solve for pattern." The Berkeley alliance is exploring solutions that work harmoniously with the regional food system.

Learning in the Real World. This non-profit organization in Woodland, California, was established "to create a mainstream debate regarding the use of computers and other 'educational technology' in the classroom." Learning in the Real World analyzes and distributes information that encourages rational decisions about when and where education technology is a positive tool for children and when it detracts from their development. It also provides research grants to university investigators in the areas of educational performance and cognitive development.

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Zenobia Barlow
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About the Edible Schoolyard

MISSION

The mission of the Edible Schoolyard at Martin Luther King, Jr. Middle School is to create and sustain an organic garden and landscape which is wholly integrated into the school's curriculum and lunch program. It involves the students in all aspects of farming the garden—along with preparing, serving, and eating the food—as a means of awakening their senses and encouraging awareness and appreciation of the transformative values of nourishment, community, and stewardship of the land.

LOCATION

The Edible Schoolyard is located on the campus of Martin Luther King, Jr. Middle School in Berkeley, California. King School is committed to practicing and teaching the ideals of Dr. King: equality, academic excellence, community action, respect for self and others, nonviolence, and leadership based on democratic principles. The King staff is committed to building and maintaining programs which will ensure success for every student in the school's increasingly diverse population. There are 910 students in 6th, 7th, and 8th grades—37% White, 36% African American, 16% Latino, and 10% Asian American. In addition, 12% of these students speak English as a second language and almost 30% qualify for the free lunch program.

A GROWING NETWORK

One important mission of the Edible Schoolyard is to serve as a model for other schools and communities. We continue to network and build alliances with the larger community. We also nurture relationships with other school garden projects and environmental programs through the Center for Ecoliteracy Network.

The Edible Schoolyard has been an active participant in the Berkeley Unified School District's Superintendents' Food Policy Advisory Committee. Inspired in part by the work being done at the Edible Schoolyard, this unique alliance seeks to increase the amount of fresh, organic foods served to children throughout the district.

Recently the Edible Schoolyard became a member of the Healthy Start Collaborative, hosting a garden and kitchen tour for organizations and individuals dedicated to improving the health and well-being of the King school community.

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LOOKING FORWARD

Over the last four years, the Edible Schoolyard Program has firmly taken root and blossomed within the King Middle School community. As the program continues to nurture the relationships that have formed over the years, it will also send out new shoots, including two new projects: the afterschool program and the lunch program. Through the afterschool program, students will be active participants in cooking and serving a nutritious, organic snack to their peers at school. This program will serve as a pilot for the school lunch program that is envisioned for the future. The vision for the lunch program includes building an ecologically-designed cafeteria in which students will prepare their own lunches, using organic produce grown in local gardens. When completed, the kitchen/cafeteria will serve as a model for institutional food service. Funding to launch a capital campaign was provided by the Boals Fund at the Center for Ecoliteracy.

SUPPORTERS OF THE EDIBLE SCHOOLYARD

The Edible Schoolyard is funded through a combination of grants and private contributions. Supporters include:

The Giant Sequoias

The Susie Tompkins Buell Foundation
Center for Ecoliteracy
The Chez Panisse Foundation

The Live Oak Trees

Berkeley Chamber of Commerce
Berkeley Horticultural Nursery
The Berkeley Public Education Foundation
Nathan Cummings Foundation
Marion Cunningham
The Eucalyptus Foundation
Fourth Street Shops
W.A. Gerbode Foundation
The Richard and Rhoda Goldman Fund
In Dulci Jubilo
Steven P. and Laurene P. Jobs
The Martin Luther King, Jr. Middle School PTA

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The Live Oaks *(continued)*

Newman's Own

Alex and Marge Singer

Mary & Stanley Smith Trust

Sur La Table

Vanguard Public Foundation

The Yih Family Foundation

The Cover Crop

Supporters who have generously provided in-kind donations

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American Soil Company

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Auto Chlor

The James Beard Foundation

The City of Berkeley

Berlin Equipment Sales]

California Linen

The Cheese Board Collective, Inc.

Chez Panisse Restaurant

The Gardener

James Painting

Monterey Market

Stan Nelson

Noah's Bagels

The Occidental Arts and Ecology Center

Picante Cocina Mexicana

Renaissance Forge

Saul's Deli

Smith & Hawken

Studio eg

Whole Foods

...and all the individuals, too numerous to mention,

who have contributed in so many ways.

For additional information about the Edible Schoolyard please contact:

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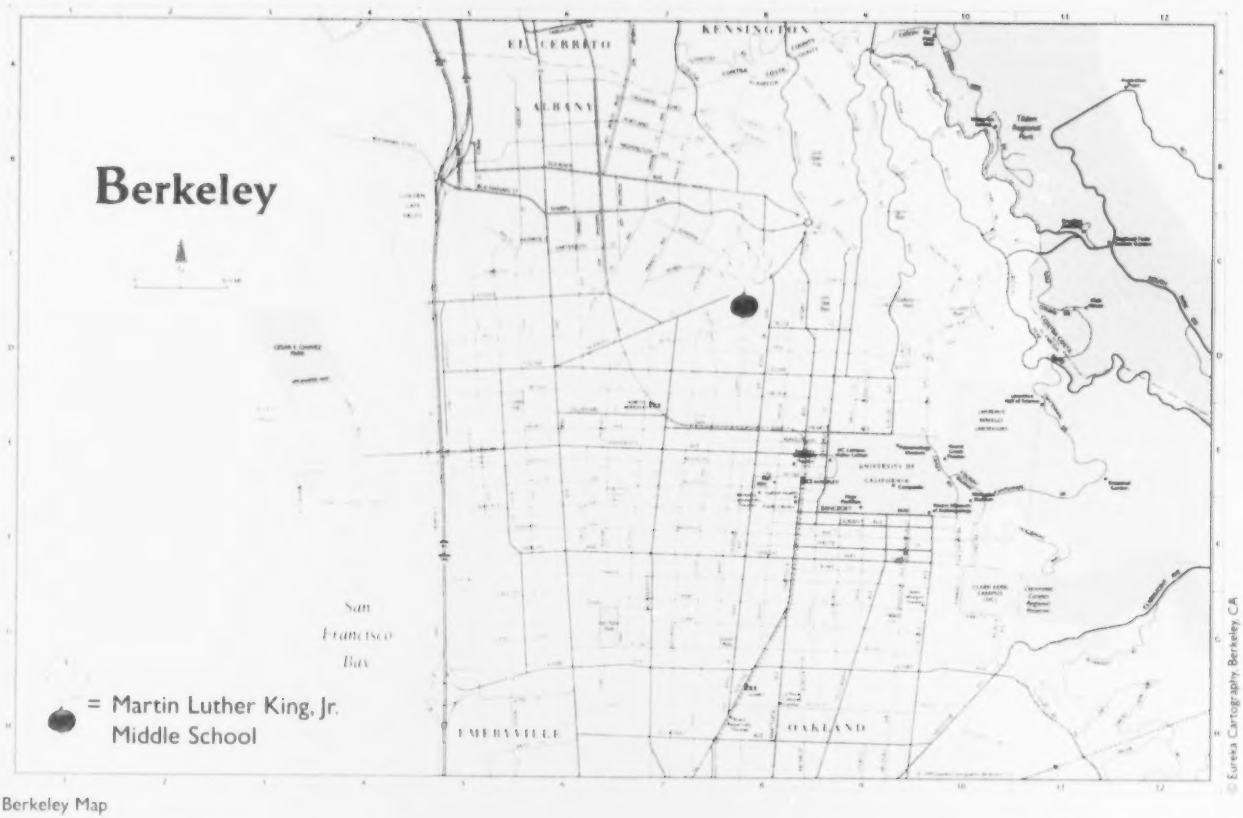
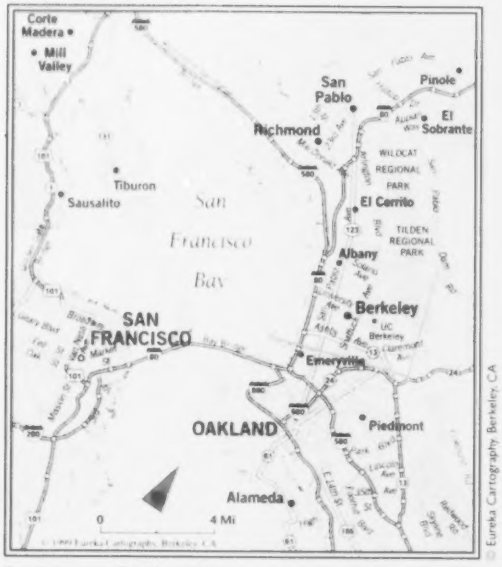
Students gather around the table to share in conversation and to appreciate their collective achievements.



Berkeley Map



San Francisco Bay Area Map

Martin Luther King, Jr. Middle School is a 17-acre site in Berkeley, California. Located on the San Francisco Bay, Berkeley is part of the San Francisco Bay-Delta watershed, the vast water system that connects the mountain streams that surround the Central Valley with San Francisco Bay and the Pacific Ocean.

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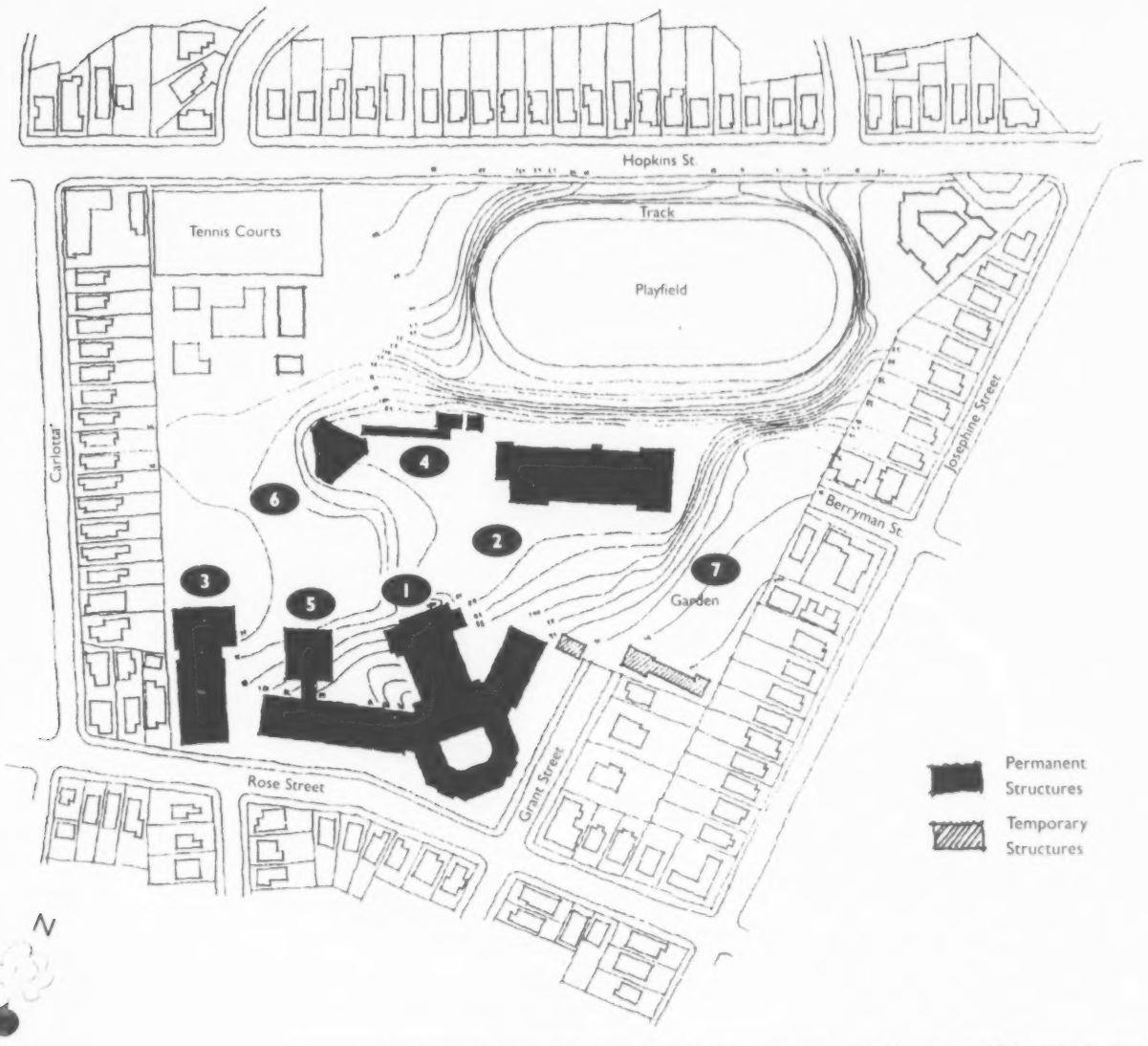

Architectural rendering of Martin Luther King, Jr. Middle School campus provided courtesy of Baker-Vilar Architects.

LEGEND

1.	Main Classroom Building (Originally Constructed)	1920
1.	Main Classroom Building (Auditorium)	1923
1.	Main Classroom Building (West Wing Addition)	1928
1.	Main Classroom Building (Remodeled)	1937
2.	Gymnasium (Constructed)	1955
3.	Science Building (Constructed)	1965
4.	Snack Bar (Constructed)	1976
5.	Media Center (Constructed)	1980
6.	Lunch Shelter/Pavilion (Constructed)	1983
7.	Edible Schoolyard Garden	1994

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Contributors

Carla Basom Bilingual/ESL coordinator Carla Basom has taught for more than 30 years in middle schools and high schools in Africa, Spain, Mexico, and California.

Jennifer Brouhard Special Day Class teacher Jennifer Brouhard has been teaching grades 6, 7, and 8 for the past two years at King. A teacher for six years, Jennifer became involved with the Edible Schoolyard project when she joined the King faculty.

Jacaranda Chas "Randa," a 7th-grade language arts and history teacher, is a kitchen mentor in the Edible Schoolyard project. A teacher for nine years, Randa has been a member of the King staff for eight years.

Jay Cohen Sixth-grade math and science teacher Jay Cohen credits the Edible Schoolyard project with being one of the reasons he joined the King faculty two years ago. Jay is a member of the Edible Schoolyard curriculum committee. Inspired by the project, Jay and his students have created a garden in their classroom and are currently growing herbs for a pizza party.

Steven Davis Assistant to Esther Cook, Steven Davis studied Culinary Arts at Laney College before becoming an Americorps member and joining the Edible Schoolyard staff. Steven played football and basketball at Fremont High School in Oakland and shares his love of sports and cooking with King students.

Patty Fujiwara A 7th-grade science teacher with 10 years experience, Patty Fujiwara joined the King faculty a year ago. As a former naturalist with the Park Service, Patty is able to incorporate her interest in outdoor education into the science curriculum through her work in the garden.

Josie Gerst A passion for cooking and gardening drew Josie Gerst to the Edible Schoolyard right from its start. Josie is a 7th grade language arts and history teacher who began her teaching career at King nine years ago.

Akemi Hamai Seventh-grade science teacher Akemi Hamai brings her science classes to the garden, which provides a real-world context for the science concepts they are learning. Akemi's teaching career began eight years ago when she joined the King faculty.

Karen Hansen Writing curriculum with Phoebe Tanner is one role Karen Hansen has in the Edible Schoolyard project. An entomologist before becoming a teacher, Karen brings a systems approach to teaching her students about ecology.

Genevieve Leslie Language arts and history teacher Genevieve Leslie views her students' experiences in the kitchen and garden as visual and tactile extensions of what they learn in the classroom. A teacher for eight years, Genevieve has been a member of the King faculty for three years and is a kitchen mentor for the Edible Schoolyard project.

Patsy McAteer Seventh-grade math teacher Patsy McAteer takes her students to the kitchen for cooking classes and for the opportunity to apply math skills to real-life situations. The students love the work and always ask, "Are we going to the kitchen today?"

Joy Osborne For Joy Osborne, being part of the Edible Schoolyard project means having the opportunity to nurture a sense of community with her students. A teacher for 20 years, Joy joined the King faculty 6 years ago and teaches 6th-grade language arts, history, and reading.

Ene Osteraas-Constable Edible Schoolyard Program Coordinator Ene Osteraas-Constable has a background in education, communications, and art. An avid gardener and cook, she has been involved with the Edible Schoolyard since its inception.

Lynne Pacunas Sixth-grade math and science teacher Lynne Pacunas is in her second year at King and thoroughly enjoys the endless learning opportunities that are available through working in the garden with her students. She brings with her four years of outdoor and environmental education experience that she gained with the National Park Service.

Kelsey Siegel A member of Americorps, Kelsey Siegel works with David Hawkins in the Edible Schoolyard garden. Kelsey brings to the project a background in environmental studies, experience working on an organic farm, and working as a professional cook, as well as a love of children. After he completes his work at King, Kelsey hopes to take the model of the Edible Schoolyard and apply it elsewhere.

Beth Sonnenberg The Edible Schoolyard project has been part of Beth Sonnenberg's life for the past five years. She is a mentor teacher for the garden and a 6th-grade math and science teacher.

Phoebe Tanner Currently spending 20% of her time writing curriculum for the Edible Schoolyard project with fellow teacher Karen Hansen, Phoebe Tanner has 14 years of teaching experience. Phoebe, who has been involved with the Edible Schoolyard project since it began, is a member of the executive committee, and teaches 6th graders math and science.

James Tyler A photographer with 30 years of experience, James Tyler specializes in capturing "bright moments" on film.

Ada Wada A teacher with 28 years of experience at Martin Luther King, Jr. Middle School, Ada Wada teaches math to 7th and 8th graders. She is active in, involved with integrating math into the kitchen curriculum of the Edible Schoolyard.

Elizabeth Wihr Special Day Class teacher Elizabeth Wihr joined the King faculty two years ago after eight years as a volunteer in the classroom. A Bay Area native and granddaughter of a horticulturalist, Elizabeth shares her passion for gardening and food with her students.

Tyrrah Young Opportunity Class teacher Tyrrah Young has been with the King faculty for five years. Tyrrah sees the kitchen as a means to help empower students who feel less empowered academically; she believes that learning through the experience often takes place without the students even realizing it.

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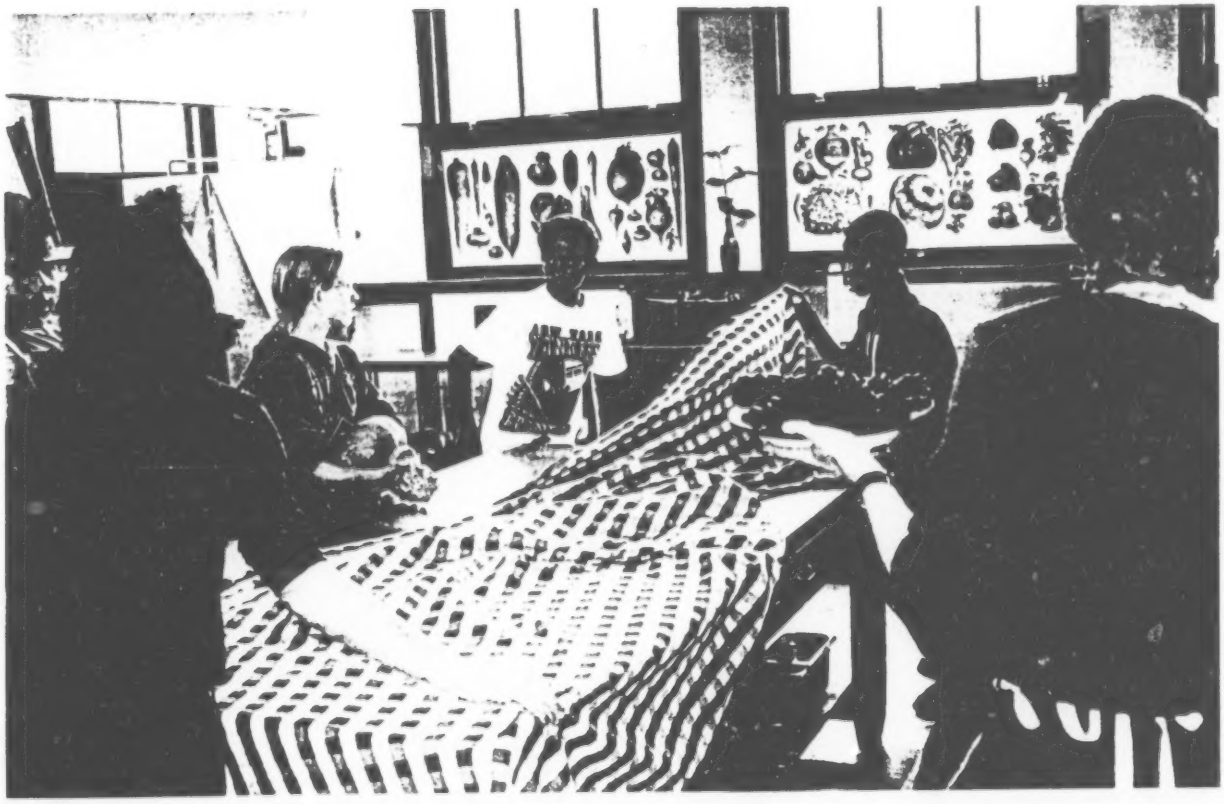
Creating an emotional climate that is conducive to emergence means creating a climate of warmth, mutual support, and trust; a climate of passion with plenty of opportunities for celebration. Indeed, celebration—of planting and sowing, of eating together, of friendship and cooperation—has become an important part of King Middle School.

FRITJOF CAPRA



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